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DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON

October 13, 1921.

MEMORANDUM No. 352.

Amendments to the Administrative Regulations.

Paragraphs 43, 132, and 133 of the Administrative Regulations are amended to read as follows:

43. EDUCATIONAL OPPORTUNITIES AND OUTSIDE EMPLOYMENT.- It is the policy of the Department to encourage employees to take educational training, provided this work does not interfere with the performance of their regular duties.

(a) Leave of absence without pay to take advanced training or carry on graduate work in recognized educational institutions will be granted whenever advantageous to the service. Arrangements for such leave should ordinarily be made some time in advance. Applications must indicate the name of the institution the employee desires to attend, and the course or courses to be pursued, and must bear the approval of the chief of bureau concerned, who shall certify that the employee can be spared for the time required without detriment to the public service.

(b) When it appears to be to the advantage of the Department employees may be transferred to part time employment and be permitted to take advanced training or graduate work in connection with recognized educational institutions.

(c) Employees engaged on work connected with agricultural colleges, experiment stations, or similar public agencies, may be retained on the rolls at a nominal annual salary or on a per-diem basis when it is deemed desirable that they should, in some way, continue their connection with the Department in order to establish or maintain cooperative relations. Each case must receive the approval of the Secretary upon the recommendation of the chief of the bureau involved.

(d) Ordinarily furlough or leave without pay will not be granted employees to engage in private or commercial work. However, the Secretary will consider applications for furlough or leave without pay from employees who wish to engage in outside undertakings. Such applications must indicate clearly the activity in which the employee proposes to engage and must bear the approval of the chief of the bureau concerned, who shall certify that the employee can be spared for the time required without detriment to the public service.

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132. WHEN GRANTED.-- Leave without pay may be allowed on account of sickness when the regular leave has been exhausted.

Pursuant to paragraph 43, leave without pay may also be granted to employees to enable them to take advanced training or carry on graduate work in recognized educational institutions, and to engage in private or commercial work.

133. LEAVE OR FURLOUGH WITHOUT PAY.-- Application for leave of absence without pay for 30 days or less must be made on the form "application for leave" prescribed by the Department and shall be forwarded with the recommendation of the chief of bureau to the chief clerk of the Department for approval. Applications for leave of absence without pay in excess of 30 days must be accompanied by a formal recommendation addressed to the Secretary and forwarded to the chief clerk of the Department for consideration and transmission to the Secretary. The application or recommendation must state the reasons for taking the leave without pay, the length of time the applicant desires such absence to continue, whether the applicant expects to engage in outside work during such leave and if so, the nature of the work. (See pars. 43 and 44 of these regulations.) In no case shall leave without pay be taken until the applicant has been advised of its approval.

Henry A. Wallace

Secretary.

Mr. Wm. L. Pryor
Room 800-A.

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AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE

GRADUATE STUDY

After somewhat extended consideration the plan for graduate study has been worked out and is here submitted. It seems to me to be a workable plan. I believe those who may be able to avail themselves of this opportunity will both enrich themselves and enhance the value of the service they render.

HENRY C. WALLACE.

JUN 15 1925

THE DEPARTMENT OF AGRICULTURE proposes to establish this fall (1921) an unofficial system of advanced instruction in those scientific and technical subjects related to the work of the Department, in which adequate instruction is not otherwise available in Washington.

1. Object. -- The purpose is to enlarge and improve the service rendered by the Department by affording an opportunity to those who wish to fit themselves for greater usefulness through better training and increased knowledge.

2. Kinds of Courses. -- It is proposed that there be two more or less distinct kinds of work offered: (a) Lecture and drill courses on what is known of certain fundamental subjects in which the personnel of two or more Bureaus may be interested; (b) intensive graduate training in special topics.

3. Who is eligible. -- Any one in the service of the Department is eligible to take these courses, provided he is adequately prepared to do so. The courses will all be of the highest University grade, hence none but advanced and serious students will be admitted to them.

4. Recognition. -- It is expected that successful completion of any of these courses will be recognized for adequate credit in some of our better educational institutions, both for undergraduate and for postgraduate degrees.

5. Number of courses a student may take. -- While several courses will be offered, it is thought that one graduate course a year generally will be sufficient. Each case, however, will be considered

on its own merits.

6. Hours. -- The time of lecture instruction will be immediately after office hours.

7. Place. -- To be announced later.

8. Cost. -- On the assumption that a class will number fifteen or more, the tuition will be $25.00 per year (30 weeks with two lectures each week), or $15.00 per half year.

Where the students are too few to meet the cost of a special lecturer, they may, in many cases, with the approval of the Educational Committee, and working through a local or other institution, have the council and guidance of some of the abler scholars of the Department. In this case the cost will have to be fixed by the institution in question.

COURSES SOME OF WHICH IT IS EXPECTED TO OFFER THIS YEAR
(1921-1922)

General or Fundamental Courses in which many may be interested

1. Biological Chemistry.

2. Plant Pathology.

3. Statistical Methods. An elementary course in the underlying principles of statistics, and training in the practical methods and applications of statistics.

4. Genetics. Fundamental laws and principles, with illustrations from both plants and animals.

5. Agricultural Economics. The first half year, at least, of this course will be given by H. C. Taylor, Chief of the Bureau of Markets.

Advanced or Graduate Courses

1. Physics of the Air. Given by Dr. W. J. Humphreys, Prof. of Meteorological Physics, Weather Bureau. Requires previous training in physics and mathematics.
Already arranged for through the George Washington University.

2. Mathematical Statistics. The mathematical development of the theory of statistics. Requires previous considerable training in pure mathematics, at least differential and integral calculus.

3. Economic Entomology.

4. Soil Physics. Requires previous training in physics.

5. Agricultural Economics. Intensive training in special phases of the subject.

6. Plant Genetics.

7. Plant Physiology.

8. Animal Genetics.

9. Plant Cytology.

TENTATIVE APPLICATION FOR INSTRUCTION
(Formal application to be made later)

NAME _____

BUREAU _____

COURSE OR COURSES IN ABOVE LIST DESIRED, ORDER OF PREFERENCE.

_____

_____

COURSE, IF ANY, DESIRED, BUT NOT LISTED ABOVE _____

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PREVIOUS TRAINING:

Education: where _____

when _____

Chief subjects _____

_____

Experience: _____

_____

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Return promptly to office of the Assistant Secretary of the Department of Agriculture.

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AGRICULTURAL ECONOMICS

UNITED STATES DEPARTMENT OF AGRICULTURE

ANNOUNCEMENT OF EDUCATIONAL COURSES FOR TERM BEGINNING FEB. 13, 1922.

Date of Opening. Courses will start on the designated days in the week beginning Monday, Feb. 13, 1922. Full-year courses will continue to the completion of 30 weeks; new half-year courses for 15 weeks.

Registration will be at the office of the Director of Scientific Work.

Tuition for one full-year course or two half-year courses taken in the same year is $25.00, of which the last $10.00 is due at the beginning of the second half-year. For a half-year course the tuition is $15.00, payable in advance.

Courses. Full year courses will be continued during the second term. New courses offered for this term are The Economics of Commodity Marketing, Agricultural Prices, and Crystallography.

Short Period Students. Field men in Washington for several weeks may be allowed to enter classes for a shorter period than the semester through arrangements with the teacher and the Director of Scientific Work. The charge for such work will be $1.00 per week, but credits will not be granted to these short time students. Students desiring to enter full year classes in the second term may do so only by permission of the instructors.

Teachers. In addition to the teachers of the first term, Dr. Alexander E. Cance, Professor of Agricultural Economics, Massachusetts Agricultural College, now temporarily on leave for service in the Bureau of Markets, will be in charge of the course in Economics of Commodity Marketing. Dr. Oscar E. Stine of the Office of Farm Management will be in charge of the course in Agricultural Prices, and Dr. Edgar T. Wherry, formerly Instructor at Lehigh University, and now with the Bureau of Chemistry, will be in charge of the course in Crystallography.

COURSES.

1 - b. Economics of Commodity Marketing (Hf.Yr.).- Dr. Alexander E. Cance, Mon. and Wed., 4:30 P.M., Room 411, Bieber Bldg. This course will involve a careful study of the geography of agricultural production, the locations of regions of surplus and deficit, the principal currents of trade, foreign and domestic, and the study of the mechanism of marketing, including an analysis of marketing functions, agencies and processes. Two lectures a week for one semester, supplemented by study of text book and collateral readings. Students who have completed the first semester's work in Dr. Taylor's course, or who have had the equivalent of this course or sufficient training in general economics, will be admitted. The course may be rated as one for graduates and under-graduates, and course credit would therefore depend on the academic status of the student as well as on his efficiency in class work.

2. Statistical Methods (Yr., 2nd Term).- Mr. H. R. Tolley and special lecturers. Tues. and Fri., 4:30 P. M., Room 411, Bieber Bldg. A continuation of the first term course. Text: Kings' "Elements of Statistical Methods".

3. Biochemistry (Yr., 2nd Term).- Dr. C. O. Appleman. Mon. and Tues., 4:30 P. M., Room 223, East Wing. A continuation of the first term course. Text: Matthews' "Physiological Chemistry", third edition, advised but not required.

4. Mycology (Yr., 2nd Term).- Dr. C. L. Shear, with special lectures on various groups, Mon. and Wed., 8:00 A. M., Room 315, West Wing. A continuation of the first term course. Text: DeBary's "Comparative Morphology and Biology of the Fungi Mycetozoa and Bacteria", with reading from more recent special texts.

5. Plant Physiology (Yr., 2nd Term). - Dr. Burton E. Livingston, Thurs. and Fri., 4:30 P. M., Room 32, West Wing. A continuation of the first term course. Reference texts: Coulter, Barnes and Cowles' "Textbook of Botany", Vol. I, Part II, Physiology (sold separately); Palladin's "Plant Physiology".

6. Genetics (Yr., 2nd Term).- Dr. Sewall Wright. Tues. and Thurs., 4:30 P.M.,Room 104, Office of Cereal Investigations, 1306 B Street., S. W. A continuation of the first term course. Reference text: Babcock and Clausen's "Genetics in Relation to Agriculture".

7. Physics of the Air (Yr., 2nd Term).- Dr. W. J. Humphreys. A continuation of the first term course. Registration for the course is through the George Washington University; time, as arranged, place, Weather Bureau; textbook, Humphreys' "Physics of the Air".

8. Agricultural Prices (Hf. Yr.). - Dr. Oscar E. Stine. Time and place to be arranged. This course involves a study of price relations and trends, and and analysis of the forces affecting or determining prices. Attention will be given to the differences in the price movements of various commodities and the causes for these differences. The relation of the prices of agricultural products to the general price level and the influence of foreign market conditions will also receive some attention. While this is essentially a graduate course, students with considerable experience in the study of price data may be admitted even though they have not fulfilled all the academic prerequisites for graduate work.

9. Crystallography (One-half Yr.).- Dr. Edgar T. Wherry. Tues. and Wed., 4:30 P.M., Room 415, Bureau of Chemistry. The application of crystallographic optical methods to the identification of crystalline chemical substances. Students must have access to microscopes equipped with Nicol prisms and revolving stages.

Further information may be had at the office of the Director of Scientific Work.

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COURSE IN SCIENTIFIC FRENCH [1922]

TO BE GIVEN THE SECOND SEMESTER OF THE GRADUATE SCHOOL OF THE

U. S. DEPARTMENT OF AGRICULTURE.

AGRICULTURAL
U.S. DEPARTMENT OF AGR

Scientific French (2nd hf.) - Dr. H. B. Humphrey. Time and recitation room to be determined (class to meet twice a week). Reading, reviewing, and abstracting of French books and papers on agricultural botany, farm crops, industries, and rural economics. The purpose of this course is to furnish such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and related industries. Fabre's Le Livre des Champs; L'industrie; Jousier; Économie Rurale; Bonnier's Le Monde Végétal. Prerequisite: A knowledge of the elements of French grammar and reading of elementary French.

The above is a course to be included among those offered by the Graduate School of the Department of Agriculture. Time and place of instruction to be arranged at preliminary meeting of the class, Monday, February 12, 4.30 P.M., Room 106, West Wing. Those wishing further information should consult the instructor Dr. H. B. Humphrey, Room 105, West Wing, 'phone 134.

U. S. DEPARTMENT OF AGRICULTURE
LIBRARY

10 October 1922

Course in Library Science.

In connection with the educational work to be carried on under the auspices of the Department for 1922-23, the Library has undertaken to give a course in library science. The first half of the course will be devoted to Cataloguing and Classification, and the second half to Bibliography and Reference Work. Both courses will be given by Miss Ellen Hedrick, who has recently been appointed as Reference Librarian in this Library. Miss Hedrick was formerly Chief Classifier at the University of California Library. She has also been an instructor for two summers at the Chautauqua Summer Library School.

The lectures will be given on Tuesdays and Fridays in the Reading Room of the Main Library from 4:45 to 5:45 p. m.

The lectures on cataloguing and classification will take up the subject under the following heads: (1) Preliminary: Use of a catalogue, kinds of catalogues, the book and its parts; (2) Author and subject headings, imprint, collation, added entries; (3) Shelf listing and accessioning; (4) Classification, including Dewey Decimal Classification, the Library of Congress Classification, and the Classification of the U. S. Department of Agriculture; (5) Publications of corporate bodies; (6) Periodicals, Yearbooks; (7) Government publications.

The Catalog Rules of the American Library Association will be used as a textbook. Practice work in cataloguing will be required in addition to the lectures.

It is preferred that those taking the course should have had college training or in lieu of that some library experience. Those who complete the course will no doubt be able to secure credit for it at George Washington University, if desired.

C. R. BARNETT

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UNITED STATES DEPARTMENT OF AGRICULTURE

ANNOUNCEMENT OF EDUCATIONAL WORK FOR 1922-1923.

Courses will start on the designated days in the week beginning Monday, Oct. 16, 1922. Year courses will run for 30 weeks; half-year courses for 15 weeks.

Registration will be at the office of the Director of Scientific Work. Tuition for one full-year course or two half-year courses taken in the same year will be $25.00 of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. For a half-year course the tuition will be $15.00, payable in advance.

Credit towards graduate degrees has been allowed for last year's courses by a number of standard graduate institutions and many others have signified their willingness to accept them when offered. Students desiring graduate credit should file a statement of their educational training and experience.

- (A) GENERAL COURSES -

1. Elementary Statistics (Yr.).- Mr. G. C. Haas. Mon. and Thurs., 4:30 P. M., 411 Bieber Bldg. Statistical units of measurement, variables, frequency distribution, classification and tabulation, types of averages, dispersion, accuracy and interpolation, sampling, index numbers, graphic presentation and analysis, logarithmic curves, and correlation.

2. Principles of Writing (1st Hf.).- Mr. J. Clyde Marquis. Tues. and Fri., 4:30 P.M., 411 Bieber Bldg. A review of the fundamental principles of rhetoric, with special reference to construction of paragraphs, outlining articles and bulletins, assembling, selecting and arranging material, clearness of expression, feature writing, editing, and correspondence. Lectures and round table discussions. (To be followed by 2b, "Technical Agricultural Writing", second semester.)

3. Elementary Agricultural Economics (1st Hf.).- Dr. L. C. Gray. Tues. and Fri., 4:30 P. M., 703 Bieber Bldg. A study of economic principles governing agricultural production. Selection of farm enterprises, size of farm, proportion of the factors of production, analysis of costs, methods of analyzing farm income, economic aspects of farm equipment, machinery and power; land utilization, tenure and policies; agricultural labor and wages, agricultural credit, and prices. (To be followed by 3b, "Marketing and Distribution of Agricultural Products", second semester.)

4. Advanced Statistical Methods (Yr.).- Mr. H. R. Tolley. Tues. and Fri., 4:30 P.M., Room 305, Farm Management. The development and application of the theory of statistics. A study of correlations, curve fitting, the theory of sampling, and their applications. Yule's "Introduction to the Theory of Statistics. Prerequisites: Elementary work in statistics and algebra through simultaneous equations.

5. Library Science (Yr.).-Miss Ellen Hedrick. Tues. and Fri., 4:30 P.M., Reading Room, Library, Bieber Bldg. Cataloging and Classification, Bibliography and Reference Work. Am. Library Assoc. catalog rules, the Library of Congress classification, the Dewey Decimal, and other classifications. National and trade bibliographies, subject bibliographies, and public documents. Open to college graduates or those having library or related training.

6. Taxonomic Botany (Yr.).-Dr. A. S. Hitchcock. Tues. and Fri., 4:30 P.M., Room 223 East Wing. This course will consist of (a) Identification of plants including local flora, economic species and foreign material, use of manuals and floras, study of

descriptions and specimens; (b) Taxonomic technique, including a discussion of classification; species and general, use of bibliographies and indices, synonomy.

- (B) GRADUATE COURSES -

7. Physical Chemistry of the Colloids (Yr.).- Dr. W.A. Patrick of Johns Hopkins University, Wed., 4:30 P.M., 2nd hour to be arranged, Room 223 East Wing. A discussion of the theory of solutions, molecular kinetic theory, simple thermodynamics, and the application of the principles involved to surface phenomena.

8. Advanced Crystallography (Yr.).-Dr.Edgar T.Wherry.Tues. and Wed., 4:30 P.M., Room 510, Bureau of Chemistry. The course is designed to present modern theories of crystal structure and their chemical significance, to aid in the reading and understanding of current articles on X-ray crystal structure, and to give practice in the measurement and drawing of crystals using the modern two-circle methods.

9. The Principles of Physical Chemistry (Yr.).-L.H.Adams, Mon. and Wed., 4:00 P.M. Fixed Nitrogen Research Laboratory. A standard university course in physical chemistry covering the phenomena discussed in Washburn's "Principles of Physical Chemistry".

10. Infection and Immunity (Yr.).-Dr.A.Parker Hitchins, Major M.C. U.S.A. Mon. and Thurs., 4:30 P.M., Room 223 East Wing. Theories and principles of infection and immunity. A study of the infectious agents, their mode of attack; the body defenses; artificial immunity; biological tests for infection and immunity; anaphylaxis and allergy. To be followed by a detailed consideration of the more important diseases, with emphasis upon their immunological characteristics. Reference Texts: Zinsser, Infection and Resistance; Kolmer, Infection, Immunity and Specific Therapyy.

11. Plant Breeding (Yr.).-Dr.C.E.Leighty, et. al. Wed. and Fri., 4:30 P.M., Room 104, Cereal Investigations. (1) The development of plant breeding; (2) fundamental principles; (3) their application to the art of plant improvement. Mass selection, pure-line selection, bud selection, hybridization, including the theory of heterosis, and the technique of practical and experimental plant breeding. Seminars will be held, and specialists will discuss special problems.

12. Advanced Economic Theory (1st Hf.).-Dr.H.C.Taylor and Dr.C.L.Stewart. Mon. and Thurs., 4:30 P.M., Room 305, Farm Management. Open to graduate students and persons who have read extensively in economic literature. A review of important economic theories and their application to present day problems. A critical study of the principal schools of economic thought, such as the English Classical School, the German Historical School, and the Austrian Psychological School. (To be followed by 12b, "Land Economics", second semester.)

13. Physics of the Air (Yr.).-Dr. W. J. Humphreys. Registration for the course is through the George Washington University; time, as arranged; place, Weather Bureau; textbook, Humphreys' "Physics of the Air."

14. Special Research Courses. Arrangements may be made for carrying on research in any field of the Department's work under direction of specialists and supervised by the Graduate Committee. Time and credit as arranged; no fee is charged.

In addition the Bureau of Standards is offering a course in Advanced Organic Chemistry by L. L. Steele on Tuesdays and Thursdays that is open to Department workers.

AGRICULTURAL
U.S. DEPARTMENT OF AGRICULTURE

PRELIMINARY ANNOUNCEMENT OF EDUCATIONAL WORK FOR 1923-24
U. S. Department of Agriculture

The lectures will start with the week beginning October 15. Each course will consist of two lectures per week, at 4:30 P. M., unless otherwise arranged. The tuition will be $25.00 per year per course or $15.00 per term -- shorter courses in proportion. Of the courses outlined and others suggested by the preliminary registration it will probably be possible to offer ten or twelve of those indicated as most desired. The standard graduate institutions have accepted these credits.

--GENERAL COURSES--

1. Accounting Principles (Yr.).-Mr. K. B. Gardiner. The principles of accounting, including cost accounting and auditing.

2. Elements of Statistical Methods (Yr.).- Mr. G. C. Haas. A course similar to that given last year.

3. Library Science (Yr.).- Miss Ellen Hedrick. This will cover the same ground as that given last year.

4. Cataloging and Reference (Yr.).- Miss Ellen Hedrick. This will be an advanced course for those who have had the elementary work.

5. Glass Blowing Technique (about 6 weeks).- Dr. S. Karrer of the Fixed Nitrogen Research Laboratory. Dr. Karrer will arrange a short course of practical instruction in glass blowing suitable for laboratory workers. Fee according to length of course.

--ADVANCED COURSES--

1. Credit, Currency, and Prices with Special Reference to the Influence of the Federal Reserve System (1st hf.).- Dr. E. A. Goldenweiser, Assistant Chief Statistician, Federal Reserve Board. This will be followed the second half by Economic Cycles by Dr. W. W. Stewart, Director of Research, Federal Reserve Board.

2. The Principles of Animal Breeding (Yr.).- Dr. L. J. Cole, Dr. Sewall Wright, and Dr. H. C. McPhee. A review of the hereditary principles involved in breeding (first half), followed by special consideration of their relation to practical problems (second half). Dr. Cole has had long experience in directing graduate work in genetics in the University of Wisconsin.

3. The Principles of Animal Pathology (Yr.).- Dr. Robert J. Formad. Dr. Formad, who formerly taught in the University of Pennsylvania, will present the basic principles of pathology together with a discussion of the special pathology of various organs and tissues.

4. Rural Sanitation (1st hf.).- Dr. Charles Wardell Stiles and Dr. L. L. Lumsden of the U. S. Public Health Service.

5. Advanced Economic Entomology (Yr.).- Prof. George A. Dean (and special lecturers). The fundamental principles of biology and environment with application to the development, distribution, and control of injurious insects will be discussed. Prof. Dean has for many years directed graduate work in entomology in the Kansas Agricultural College.

6. Plant Physiology (Yr.).- Dr. Burton E. Livingston of Johns Hopkins University. This is a repetition of the admirable course that Dr. Livingston gave two years ago.

7. Plant Cytology (Yr.).- Dr. B. O. Dodge. Dr. Dodge has had teaching experience in the University of Wisconsin and in Columbia University. Dr. Dodge will supervise a course in laboratory technique by individual assignment. It is hoped to arrange for special lectures the second half year.

8. Plant Geography (Yr.).- Dr. H. L. Shantz. Dr. Shantz' extended investigations should enable him to give a very valuable course to those interested in soil relations, plant adaptations or climatic influences in relation to agricultural use.

9. Botany in Relation to Plant Culture (Yr.).- Dr. C. V. Piper. Dr. Piper will discuss the fundamental relations of the plant to cultural possibilities both from the standpoint of structure and adaptive relations.

10. Bacteriology (1st hf.).- Dr. F. V. Rand. An advanced discussion of bacterial phenomena and properties. Dr. Rand is giving this course in Johns Hopkins University. This will be followed the second half year by Applied Plant Bacteriology by Dr. Rand, an advanced course discussing geographic and taxonomic distribution, susceptibility and resistance.

11. Theory of Analytical Chemistry (Yr.).- Dr. J. E. Zanetti of Columbia University. An intermediate course discussing the principles underlying organic chemistry. Especially valuable to those who are not specialists in chemistry but would like to get the fundamentals.

12. Advanced Physical Chemistry (Yr.).- (One lecture per week). Dr. E. W. Washburn of the University of Illinois. Dr. Washburn is one of the leading physical chemists and this will be an exceptional opportunity for Department workers to get the latest discussions in this field. It is expected that this course will be continued next year. Fee will be for a half year course.

13. Advanced Statistical Methods (Yr.).- The first half year will be given by Mr. H. R. Tolley. This will be similar to the course given last year. The second half year will be given by Dr. Sewall Wright and will be a continuation of the work of the preceding term.

14. Physics of the Air (Yr.).- Dr. W. J. Humphreys (in connection with the George Washington University).

The Bureau of Standards is offering a number of graduate courses beginning the week of October 8. Most of these are advanced work in physics and mathematics. Complete outlines may be seen in the Director's office.

Course C, "Colloidal Chemistry" by Dr. W. A. Patrick of Johns Hopkins University, is the same course that was given in this Department last year. The first meeting will be held at 3:30 P. M., October 10.

BUREAU OF AGRICULTURAL ECONOMICS U.S. DEPARTMENT OF AGRICULTURE

UNITED STATES DEPARTMENT OF AGRICULTURE
ANNOUNCEMENT OF EDUCATIONAL WORK FOR 1923-24

Courses will start on the designated days in the week beginning Monday, Oct. 15, 1923. Year courses will run for 30 weeks; half-year courses for 15 weeks.

Registration will be at the office of the Director of Scientific Work. Tuition for one full-year course or two half-year courses taken in the same year will be $25.00 of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. For a half-year course the tuition will be $15.00, payable in advance. Shorter courses in proportion.

Credit towards graduate degrees has been allowed for last year's courses by a number of standard graduate institutions and many others have signified their willingness to accept them when offered. Students desiring graduate credit should file a statement of their educational training and experience.

All classes meet at 4:30 P.M. The East and West Wings and Entomology Building are on the Department grounds, 13th and B Sts., S.W. Cereal Investigations Building is located at 1306 B St.; Bieber Building, 1358 B St.; Motion Picture Laboratory, 1363 C St.; Crop Estimates, 200-14th St.; and Extension, 220-14th St., all Southwest.

--GENERAL COURSES--

1. Accounting Principles (Yr.).- Mr. K. B. Gardiner. Mon. and Fri., 411 Bieber Bldg. The principles of accounting. The distinction between capital and revenue, principles of depreciation, interpretation of balance sheets, principles of cost accounting, statistics in accounting, trust and insurance accounting and auditing. Prerequisites: A practical working knowledge of bookkeeping and accounting up to and including the preparation of income statements.

2. Elements of Statistical Methods (Yr.).-Mr. G. C. Haas. Tues. and Thurs., 411 Bieber Bldg. Statistical units of measurement, variables, frequency distribution, classification and tabulation, types of averages, dispersion, accuracy and interpolation, sampling, index numbers, graphic presentation and analysis, logarithmic curves, and correlation.

3. Library Science (Yr.).- Miss Ellen Hedrick. Tues. and Fri., Library, Bieber Bldg. Cataloging and classification, bibliography and reference work. American Library Assoc. catalog rules, the Library of Congress classification, the Dewey Decimal, and other classifications. National, trade, and subject bibliographies, public documents. Open to college graduates or those having library or related training.

5. Glass Blowing Technique (about 6 weeks).- Dr. S. Karrer (and others). A short course of practical instruction in glass blowing suitable for laboratory workers. Fee according to length of course. First meeting, Wednesday, Motion Picture Laboratory.

--ADVANCED COURSES--

1. Credit, Currency, and Prices with Special Reference to the Influence of the Federal Reserve System (1st hf.).-Dr. E. A. Goldenweiser. Mon. and Fri., Room 305, Crop Estimates. The relationship between the volume of member bank and reserve bank credit in use and the level of production, interest rates, and prices; the services of the reserve banks to the business of the country, the effect of the recent influx of gold on the domestic credit situation. (To be followed second half by Economic Cycles by Dr. W. W. Stewart.)

2. The Principles of Animal Breeding (Yr.).- Dr. L. J. Cole and Dr. Sewall Wright, assisted by Dr. H. C. McPhee. Wed. and Fri., Room 224, East Wing. A review of the hereditary principles involved in breeding followed (second half) by a special consideration of their relation to practical problems in animal husbandry. Special lectures by outside authorities in the subject whenever opportunity offers.

3. The Principles of Animal Pathology (Yr.).- Dr. Robert J. Formad. Tues. and Thurs., Room 224, East Wing. An advanced course presenting (first half) the basic principles of pathology, disorders of nutrition, disturbances of the circulation, retrogressive and progressive tissue changes, inflammation, tumors, and changes caused by animal and plant parasites. (Second half) Special pathology of the blood and the various organs and tissues of the body, pathological aspects of tuberculosis, glanders, anthrax, and other infectious diseases of animals. Reference text recommended but not required: A Text-Book of Pathology, by Delafield & Prudden.

5. Advanced Economic Entomology (Yr.).- Prof. George A. Dean (and special lecturers). Tues. and Fri., third floor, Entomology Bldg. The fundamental principles of biology in their relations to economic entomology. Natural and artificial control of injurious species, special methods, insect ecology, disease transmission, plant immunity, biometrics.

6. Plant Physiology (Yr.). - Dr. Burton E. Livingston. Tues. and Sat., Motion Picture Lab. An advanced course discussing the plant body with reference to retention of form, entrance movement and exit of material, material changes within the body, growth under symmetrical and unsymmetrical conditions (bending). The environmental control of plant activity and the application to agricultural operations will be considered. Reference texts: Coulter, Barnes and Cowles" "Textbook of Botany", Vol. I, Part II. Physiology (sold separately); Palladin's "Plant Physiology".

8. Plant Geography (Yr.).- Dr. H. L. Shantz. Mon. and Wed., Room 325, Extension Bldg. Floristic and ecological methods. The ecological classification of plant communities. Methods of measuring factors. The natural vegetation of the world as a whole, its economic value and its correlation with climatic conditions. The plant communities of the United States and their differentiation, distribution, relation to physiographic regions and to soil and climatic provinces. What plant communities indicate in reference to agricultural potentiality.

12. Advanced Physical Chemistry (Yr.).-(One lecture per week). Dr. E.W. Washburn. Mon., Montion Picture Lab. This will be an exceptional opportunity for Department workers to get the latest discussions in this field. It is expected that this course will be continued next year. Fee will be for a half-year course. A complete outline of the course can be seen in the Director's office.

13. Advanced Statistical Methods (Yr.).- (First half) Mr. H.R.Tolley. Tues. and Thurs., Room 305, Crop Estimates. Frequency distribution, sampling, and gross correlation. Prerequisites: Elementary statistical methods or its

equivalent, algebra, geometry and preferably calculus. (Second half) Dr. Sewall Wright. Theories of probability and chance; interpretation of systems of correlated variables with the aid of such methods as partial correlation, multiple correlation and path coefficients; curve fitting; analysis of time series, including index numbers.

14. Physics of the Air (Yr.).- Dr. W. J. Humphreys, Registration for the course is through the George Washington University; time, as arranged; place, Weather Bureau; textbook, Humphrey's "Physics of the Air".

15. Special Research Courses. Arrangements to be made with committee.

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PRELIMINARY ANNOUNCEMENT OF EDUCATIONAL WORK FOR 1924-25.
U. S. Department of Agriculture.

BUREAU OF AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE

The lectures will start with the week beginning October 20. Each course will consist of two lectures per week, at 4:30 P. M., unless otherwise arranged. The tuition will be $25.00 per year per course or $15.00 per term. Of the courses outlined and others suggested by the preliminary registration it will probably be possible to offer ten or twelve of those indicated as most desired. The standard graduate institutions have accepted these credits.

--GENERAL AND REVIEW COURSES--

1. Elements of Statistical Methods (Yr.).-Mr. B. B. Smith. A course similar to that given last year.

2. A Review of Mathematics up to Calculus With Especial Reference to Statistical Methods.- If a sufficient number desire such a course, arrangements will be made with some institution to give this course at the Department.

3. Agricultural Writing (1st hf.).- J. Clyde Marquis.

--ADVANCED COURSES--

1. Principles of Nutrition (Yr.).- Dr. Paul E. Howe, Dr. Louise Stanley, with special lectures by Dr. L. B. Mendel and others.

2. Morphology and Physiology of Insects (Yr.).- Mr. R. E. Snodgrass and Dr. C. H. Richardson. An advanced course discussing the structure and function of the parts and organs of the different orders of insects.

3. Textile Fibers (1 hr., 1st hf.).- Seminar course to be organized by Miss Ruth O'Brien, to which various people in the Department in touch with problems of production and handling of textile fibers will be asked to contribute.

4. Plant Geography (1st hf.).- Dr. H. L. Shantz will complete the course started last year. His extended investigations should enable him to give a very valuable course to those interested in soil relations, plant adaptations or climatic influences in relation to agricultural use. To be followed by:

5. Botany in Relation to Plant Culture (2nd hf.).- Dr. C. V. Piper. Dr. Piper will discuss the fundamental relations of the plant to cultural possibilities both from the standpoint of structure and adaptive relations.

6. Advanced Statistical Methods (Yr.).- Mr. H. R. Tolley. This will be similar to the course given last year.

7. Genetics (Yr.).- Dr. Sewall Wright. A fundamental discussion of the principles of inheritance necessary to the understanding of plant and animal breeding. (Genetics, Plant Breeding and Animal Breeding are given in a three-year cycle).

8. Rural Sociology (Yr.).- Dr. C. J. Galpin. Dr. Galpin's long experience in this research field should enable him to give an exceptionally valuable course.

9. Principles of International Trade with Especial Reference to Agriculture. (1st hf.).- Dr. G. B. L. Arner. A study of the general principles of International trade and the grounds for trade policy with especial reference to trade in agricultural products.

10. The Organization of Research (Yr.).- Dr. E. W. Allen with special lectures by leading scientists in different fields.

11. Farm Machinery (Yr.).- Mr. C. D. Kinsman with Special Lectures by others.

12. Organic Chemistry (Yr.).- Dr. S. F. Acree, formerly instructor in the Johns-Hopkins University. Dr. Acree is an experienced teacher and this should be a very attractive course.

13. Physics of the Air (Yr.).- Dr. W. J. Humphreys (in connection with the George Washington University).

Bureau of Standards Courses

The following courses offered by the above Bureau should interest Department workers:

Advanced Organic Chemistry. Prof. M. S. Kharasch of the University of Maryland. 2 hour lecture once a week. Previous courses in organic chemistry will be required.

The Fundamental Concepts of Physics in the Light of Modern Discovery by Dr. P. R. Heyl. Mon. and Wed. at 4:30 P.M., beginning Sept. 29. This course takes the place of the Physics Club program for the year. Fee, $5.00. Those wishing to take this course should get a special blank from this office and send in at once.

Applications accompany this announcement. Please return to the Office of the Director of Scientific Work as soon as convenient as the courses given will be determined by the preliminary applications. Registrants are invited to suggest courses not listed, if they desire them.

TENTATIVE APPLICATION FOR INSTRUCTION
(Formal registration to be made later)

Please return this application as soon as possible as the courses given will be determined by the preliminary applications.

Name_____ Bureau_____

Courses desired in order of preference_____

_____

_____

Courses desired but not listed above_____

_____

Are you a college graduate?_____

Graduate work completed or advanced degrees?_____

_____

To be returned to the Office of the Director of Scientific Work before Oct. 6, 1924.

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BUREAU OF AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE

UNITED STATES DEPARTMENT OF AGRICULTURE
ANNOUNCEMENT OF EDUCATIONAL WORK FOR 1924-25

Courses will start on the designated days in the week beginning Monday, October 20, 1924. Year courses will run for 30 weeks; half-year courses for 15 weeks.

Registration will be at the office of the Director of Scientific Work. Tuition for one full-year course or two half-year courses taken in the same year will be $25.00 of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. For a half-year course the tuition will be $15.00, payable in advance. Shorter courses in proportion.

Credit towards graduate degrees has been allowed for these courses by a number of standard graduate institutions and many others have signified their willingness to accept them when offered. Students desiring graduate credit should file a statement of their educational training and experience.

All classes meet at 4:30 P.M. The East and West Wings and Entomology Building are on the Department grounds, 13th and B Sts., S.W. Cereal Investigations Building is located at 1306 B St.; Bieber Building, 1358 B St.; Motion Picture Laboratory, 1363 C St.; Crop Estimates, 200-14th St.; and Building "F", 7th and B Sts., all Southwest.

--GENERAL COURSES--

1. A Review of Mathematics up to Calculus with Especial Reference to Statistical Methods (1st hf.).- Dr. W. D. Lambert. Tues. and Fri., Motion Picture Lab. To be followed by a course in Calculus the second half.

2. Elements of Statistical Methods (Yr.).- Mr. B. B. Smith. Tues. and Thurs., 411 Bieber Bldg. Applicability of statistical method; standard measure of the single series; methods and measures of interrelation between series; graphic analysis; mechanical aids to statistical tasks; time series; precision of statistical measurements; detailed distribution of the methods used in several technical investigations and discussions.

3. Elementary Scientific French (Yr.).- Dr. H. B. Humphrey. Mon. and Wed., 106 West Wing. A course in elementary French with special emphasis on the acquisition of a working vocabulary of words commonly used in scientific publications. Preparation for reading scientific and technical articles in the French language.

4. Agricultural Writing and Editing (1st hf.).- Mr. J. Clyde Marquis. Tues. and Thurs., 709 Bieber Bldg. Lectures and demonstrations of the principles and methods of writing and editing agricultural news, articles, reports, reviews, abstracts, popular and technical bulletins. Assembling, selection, arrangement and illustration of material will be discussed. Magazine writing will be given particular attention.

--ADVANCED COURSES--

1. Advanced Statistical Methods (Yr.).- Mr. H. R. Tolley. Mon. and Fri., 411 Bieber Bldg. The development and application of the theory of statistics. A study of correlation, curve fitting, the theory of sampling, and their applications. Yule's "Introduction to the Theory of Statistics". Prerequisites: Elementary work in statistics and algebra through simultaneous equations.

2. Principles of International Trade with Especial Reference to Agriculture (1st hf.).- Dr. G. B. L. Arner. Wed. and Fri., 305 Crop Estimates. Geographical and historical foundations of international trade. Trade theories, past and present. Protection and free trade. Bounties and trade restrictions. Foreign exchange and international credit. The position of agriculture in international trade. Conditions determining foreign demand for agricultural products. Development of markets. Effects of the war on international trade.

3. Genetics (Yr.).- Dr. Sewall Wright. Mon. and Wed., 224 East Wing. An advanced course discussing the physical basis of heredity with especial regard to the behavior of the chromosomes; Mendelian heredity; linkage relations; sex determination; irregular modes of inheritance; variation and mutation; biometry; the mass effects of Mendelian heredity; inbreeding and cross breeding; selection. Reference texts: Morgan, Sturtevant, Muller and Bridges' "Mechanism of Mendelian Heredity", Castle's "Genetics and Eugenics", or Babcock and Clausen's "Genetics in Relation to Agriculture", East and Jones' "Inbreeding and Outbreeding".

4. Principles of Nutrition (Yr. - Seminar one hour per week).- Dr. Paul E. Howe, Dr. Louise Stanley (with special lectures). Thurs., Room 4-225, Building "F". Selected phases of the nutrition of man and animals, such as digestion, food requirements, specific effects of foods, accessory factors, nutritive conditions in growth, lactation, and muscular activity, will be discussed. Prerequisite: A course in nutrition.

5. Morphology and Physiology of Insects (yr.).- (First half) Mr. R. E. Snodgrass. Tues. and Thurs., third floor, Entomology Building. Morphology: The fundamental structure of insects as understood from a study of embryonic development; the external and internal organs will be described in detail, and their modifications traced in the various Orders according to the line of specialization followed in the evolution of each group. (Second half) Dr. C. H. Richardson. Physiology: including digestion, excretion, growth metamorphosis, respiration, circulation, the special senses, tropisms, effects of environmental conditions and related topics.

6. Plant Geography (2nd hf.).- Dr. H. L. Shantz will complete during the second semester the course which was discontinued last year. This will be followed by Botany in Relation to Plant Culture by Dr. C. V. Piper in 1925-26.

7. The Nature and Method of Research (1st hf.).- Dr. E. W. Allen, with special lectures by leading scientists in different fields. Mon. and Wed., Motion Picture Lab. The ideals, methods, interpretation, and organization of research. The qualities of science, the means by which it grows, and the classes of scientific effort. The method of science, the essentials of research, and preparation for it. The formulation of scientific problems, the organization of research projects, methods and technique in different fields of inquiry, the interpretation of data, the function of administration in research, the determination of the research program, correlation, and cooperation.

8. Organic Chemistry (Yr.).- Dr. S. F. Acree. Tues. and Thurs., 224 East Wing. A course in the chemistry of organic compounds with experimental demonstrations arranged especially for biologists who have had elementary organic chemistry. Stress will be laid on the fundamental relations of organic compounds and the applications of physical organic methods to biological research. (Laboratory work may be taken in George Washington University, if desired.)

9. Physics of the Air (Yr.).- Dr. W. J. Humphreys (in connection with the George Washington University).

10. Special Research Courses. Arrangements to be made with committee.

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BUREAU OF AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE

UNITED STATES DEPARTMENT OF AGRICULTURE

ANNOUNCEMENT OF EDUCATIONAL COURSES FOR TERM BEGINNING FEB. 16, 1925.

Date of Opening. Courses will start on the designated days in the week beginning Monday, February 16, 1925.

Registration will be at the office of the Director of Scientific Work. Tuition for one full year-course or two half-year courses taken in the same year will be $25.00 of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. For a half-year course the tuition will be $15.00, payable in advance. Shorter courses in proportion.

Credit towards graduate degrees has been allowed for these courses by a number of standard graduate institutions and many others have signified their willingness to accept them when offered. Students desiring graduate credit should file a statement of their educational training and experience.

Short Period Students. Field men in Washington for several weeks may be allowed to enter classes for a shorter period than the semester through arrangements with the teacher and the Director of Scientific Work. The charge for such work will be $1.00 per week, but credits will not be granted. Students desiring to enter full year classes in the second semester should consult the teacher.

All classes meet at 4:30 P. M. The East and West Wings and Entomology Building are on the Department grounds, 13th and B Sts., S.W. Cereal Investigations Building is located at 1306 B St.; Bieber Building, 1358 B St.; Motion Picture Laboratory, 1363 C St.; Crop Estimates, 200-14th St.; and Building "F", 7th and B Sts., all Southwest.

--GENERAL COURSES--

1. Calculus (2nd hf.).- Mr. W. D. Lambert. Tues. and Fri., Motion Picture Lab. A general course leading to an understanding of fundamental processes rather than on facility in algebraic manipulation, but some facility is essential to a real understanding of the subject. Attention will be given to topics especially important to students of the mathematical theory of statistics. Textbook: Townsend and Goodenough's "Essentials of Calculus", 2nd ed. (Henry Holt & Co.). Prerequisites: Algebra(including logarithmic and quadratic equations), plane trigometry and plane analytic geometry.

2. Elements of Statistical Methods (Yr.).- Mr. B. B. Smith. Tues. and Thurs., 411 Bieber Bldg. A discussion of correlation methods, graphic methods, time series and index numbers, descriptions of several complete analyses of actual statistical problems,- the methods used, the results obtained. New students should have a thorough knowledge of the methods of averages, and measurements of dispersion.

3. Elementary Scientific French (Yr.).- Dr. H. B. Humphrey. Mon. and Wed., 106 West Wing. The work will cover the following: Completion of first course in elementary French grammar; continued acquisition of scientific vocabulary and construction of sentences involving use of scientific terminology; reading of elementary scientific text with special attention to work of Henri Fabre.

--ADVANCED COURSES--

1. Advanced Statistical Methods (Yr.).- Mr. H. R. Tolley. Mon. and Fri., 411 Bieber Bldg. The theory of sampling and its application to the collection and the interpretation of statistics; the relation of the theory of sampling to the mathematical theory of probability; the normal growth of error-- the computation and and the interpretation of probable error of averages; standard deviations; co-efficients of correlations, etc.

2. Value and Distribution (2nd hf.).- Dr. G. P. Watkins of the Federal Trade Commission. Tues. and Thurs., 305 Crop Estimates. Informal lectures, collateral reading and discussion; the theory of economic value, and the theory of distribution as a phase of the theory of value, will be developed with some reference to historical backgrounds. Some practical extensions of theory in the valuation of public service properties and other processes of price - determination will be considered. Carver's "Distribution of Wealth" supplemented, by assigned readings, will be used to furnish points of departure for discussion.

3. Genetics (Yr.).- Dr. Sewall Wright. Mon. and Wed., third floor, Entomology Building. An advanced course discussing variation and mutation; biometry; the mass effects of Mendelian heredity; inbreeding and cross breeding; selection. Reference texts: Morgan, Sturtevant, Muller and Bridges' "Mechanism of Mendelian Heredity", Castle's "Genetics and Eugenics", or Babcock and Clausen's "Genetics in Relation to Agriculture", East and Jones' "Inbreeding and Outbreeding".

4. Principles of Nutrition (Yr.- Seminar one hour per week).- Dr. Paul E. Howe, Dr. Louise Stanley. Thurs., Room 4-225, Building "F". A seminar in which will be discussed selected phases of the nutrition of man and animals, e.g., food requirements, accessory factors, nutritive conditions in various special states, such as growth and lactation. Prerequisite: A course in nutrition.

5. Morphology and Physiology of Insects (Yr.) (Second half) Dr. C. H. Richardson. Tues. and Thurs., third floor, Entomology Building. Physiology: This course will include a discussion of digestion, absorption, assimilation, excretion, growth, metamorphosis, circulation, the tropisms and related topics.

6. Plant Geography (2nd hf.).- Dr. H. L. Shantz will complete the course which was discontinued last year. Mon. and Wed., Room 224 East Wing. The classification and distribution of the major plant communities of the world, their general character and value as forest or grazing lands, their correlation with climatic and soil conditions and their value as indications of potential agricultural use. Illustration and detailed studies are drawn largely from the vegetation of the United States and Africa.

7. Organic Chemistry (Yr.).- Dr. S. F. Acree. Tues. and Thurs., 224 East Wing. A course in the chemistry of organic compounds with experimental demonstrations arranged especially for biologists who have had elementary organic chemistry. Stress will be laid on the fundamental relations of organic compounds and the applications of physical organic methods to biological research. (Laboratory work may be taken in George Washington University, if desired.)

8. Physics of the Air (Yr.).- Dr. W. J. Humphreys (in connection with the George Washington University).

9. Special Research Courses. Arrangements to be made with committee.

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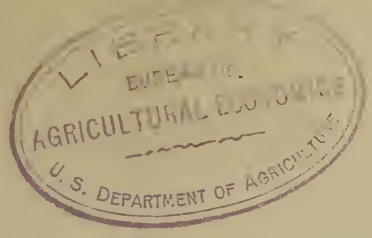


October 3, 1925

U. S. DEPARTMENT OF AGRICULTURE

SUGGESTED FUTURE EDUCATIONAL COURSES AND COURSE CYCLES

(Consideration and Suggestions Invited)

When the educational courses of the Department were established four years ago, there was a large accumulated demand for them from workers who had long desired such opportunities. This demand has made it necessary to give some courses, such as Elementary Statistical Methods and Advanced Statistical Methods, every year for several years. Other courses have been given in two succeeding years, or in every second year.

The decreased enrollment in 1924-25 shows that much of this accumulated demand has been met. Turnover in the scientific personnel is not large, and additions due to appropriation increases are not numerous. It is to be expected, therefore, that it will not be necessary, in the future, to offer most courses oftener than once in two, three, or four years. This fact, and the wish to enlarge the number of educational opportunities offered to the workers, make it desirable to attempt to establish cycles or sequence of courses.

Subject-matter subcommittees have been appointed to consider the needs of the personnel and the possibilities of offering courses in the many different lines of agricultural activity. They have had but limited time in which to attempt this huge task. However, they have made many suggestions, which it is desired to place before the Department personnel for consideration and suggestion during the coming year.

The subcommittee suggestions as to courses, and possible sequence and frequence of occurrence, are arranged by subject-matter groups in the attached tables. These suggestions are wholly tentative. They do not obligate the Graduate School committee to provide these courses at the time and in the sequence tentatively suggested. Any attempt to forecast the frequency with which any particular course will be applied for by a sufficient number of students is purely a matter of guesswork at this time.

Interested persons throughout the Department are invited to offer suggestions concerning courses listed or not listed, and concerning these tentative cycles. For their convenience, the personnel of the subject-matter subcommittees is attached. Suggestions may be made to any member of the appropriate subcommittee or to the Chairman of the Committee on Educational Courses. Suggestions made in writing will be especially helpful.

SUBJECT-MATTER SUBCOMMITTEES

of the

DEPARTMENT COMMITTEE ON EDUCATIONAL COURSES

Dr. Carleton R. Ball, Temporary Chairman

General Technology and Language and Composition

Dr. C. W. Warburton, Dir. Ext., Chm.
Dr. E. W. Allen, Expt. Sta.
Dr. M. C. Merrill, Pubs.
Dr. C. B. Smith, Off. Ext. Work.

Mathematics

Mr. H. R. Tolley, Ag. Econ., Chm.
Dr. W. J. Humphreys, Weather.
Mr. S. H. McCrory, Pub. Rds. & Rur. Eng.
Dr. Sewall Wright, An. Ind.

Chemistry and Physics

Dr. Charles Thom, Chem., Chm.
Dr. R. O. E. Davis, Soils.
Dr. W. J. Humphreys, Weather.
Dr. S. Karrer, Fixed Nit. Lab.
Dr. W. W. Stockberger, Pers. & Bus. Adm.

Plant Science

Dr. C. R. Ball, Pl. Ind., Chm.
Dr. Charles Brooks, Pl. Ind., Acting Chm.
Dr. A. C. Baker, Ent.
Mr. E. E. Carter, For. Serv.
Dr. A. S. Hitchcock, Pl. Ind.
Dr. W. W. Stockberger, Pers. & Bus. Adm.

Animal Science

Dr. Marion Dorset, An. Ind., Chm.
Dr. W. B. Bell, Biol. Surv.
Dr. A. L. Quaintance, Ent.
Dr. L. A. Rogers, Dairying.
Dr. Louise Stanley, Home Econ.
Dr. Sewall Wright, An. Ind.

Agricultural Economics

Dr. L. C. Gray, Ag. Ec., Chm.
Dr. Louise Stanley, Home Econ.
Dr. O. C. Stine, Ag. Ec.
Mr. H. R. Tolley, Ag. Ec.

TENTATIVE CYCLES OF SUGGESTED EDUCATIONAL COURSES.

1926-27	1927-28	1928-29	1929-30	1930-31
		General Technology		
Agric. Bibliography	Special Bibliography, as Biochemistry, Genetics, Plant Pathology, Nutrition, etc. (Separate courses for librarians and scientists)			
Organization and Methods of: Research | Extension	Photography		Organization and Methods of: Research | Extension	Photography
		Language and Composition		
Elem. Scien. French	Adv. Scien. French	Elem. Scien. Italian	Adv. Scien. Italian	Elem. Scien. French
Adv. Scien. German	Elem. Scien. German	Adv. Scien. German	Elem. Scien. Russian	Adv. Scien. Russian
	Agricultural Writing: General | Bulletin		Agricultural Writing: General | Bulletin	
		Mathematics		
Adv. Stat. Methods	Elem. Stat. Methods	Adv. Stat. Methods	Review of Math.: General | Calculus	Elem. Stat. Methods
		Chemistry and Physics		
Colloids	Chem. Thermodynamics	Oxid.Reduc. Equilibria | Prin. Phys.Chem.	Colloids	Chem. Thermodynamics
Biochemistry	Special Organic Chemistry		Biochemistry	Spec. Organic Chem.
Phys. Measurements	Biophysics	Adv. Crystallography	Phys. Measurements	Biophysics
Physics	of the Air and Climatology continuously, with		George Washington University.	

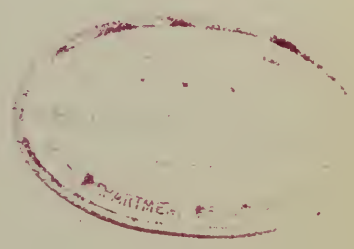
1926-27	1927-28	1928-29	1929-30	1930-31
		Plant Science		
Morphology: General | Crop Plant	Taxonomy: General | Crop Plant	Plant Geography	Botany (Non-technical)	Morphology: General | Crop Plant
Weeds | Seeds	Review Agr. Botany	Cytology	Weeds | Seeds	Review Agr. Botany
Special Plant Path.	Plant Physiology	Mycology	Special Plant Path.	Plant Physiology
		Genetics		
Animal Breeding	Prin. of Genetics	Plant Breeding	Animal Breeding	Prin. of Genetics
		Animal Science		
Biochemical Methods (Seminar)	Prin. of Nutrition (Seminar)	Biochemical Methods (Seminar)	Prin. of Nutrition (Seminar)	Biochemical Methods (Seminar)
Entomology: Taxonomy | Ecology	Taxonomy of Vertebrates. (Every 5th year)			Entomology: Taxonomy | Ecology
Comparative Physiology.	Bacteriology. | Immunology			Comparative Physiology.
		Agricultural Economics		
Geog. of Agr. Prod. | History of Agric.	Prin. of Agricultural Economics.	Marketing: Principles | Cooperation.	Geog. of Agr. Prod. | History of Agric.	Prin. of Agricultural Economics.
Money and Banking. | Int'l. Trade and Exchange	Prices (Econ. Cycles and Forecasting)	Economic Theory	Money and Banking. | Int'l. Trade and Exchange	Prices (Econ. Cycles and Forecasting)
		Economics of Consumption.		

1925

UNITED STATES

DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL



MAKING AVAILABLE FACILITIES

For

STUDY AND RESEARCH

(27 Stat. 395)
(31 Stat.1010)

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WASHINGTON
D.C.

GRADUATE SCHOOL
UNITED STATES DEPARTMENT
OF AGRICULTURE

AUTHORITY

RES. April 12, 1892, No. 8 (27 Stat. 395)

"Whereas, large collections illustrative of the various arts and sciences and facilitating literary and scientific research have been accumulated by the action of Congress through a series of years at the national capital; and

"Whereas it was the original purpose of the Government thereby to promote research and the diffusion of knowledge, and is now the settled policy and present practice of those charged with the care of these collections specially to encourage students who devote their time to the investigation and study of any branch of knowledge by allowing to them all proper use thereof; and

"Whereas it is represented that the enumeration of these facilities and the formal statement of this policy will encourage the establishment and endowment of institutions of learing at the seat of Government, and promote the work of education by attracting students to avail themselves of the advantages aforesaid under the direction of competent instructors; Therefore,

"Resolved, * * * That the facilities for research and illustration in the following and any other Governmental collections now existing or hereafter to be established in the city of Washington for the promotion of knowledge shall be accessible, under such rules and restrictions as the officers in charge of each collection may prescribe, subject to such authority as is now or may hereafter be permitted by law, to the scientific investigators and to students of any institution of higher education now incorporated or hereafter to be incorporated under the laws of Congress or of the District of Columbia, to wit:

One. Of the Library of Congress.
Two. Of the National Museum.
Three. Of the Patent Office.
Four. Of the Bureau of Education.
Five. Of the Bureau of Ethnology.
Six. Of the Army Medical Museum.
Seven. Of the Department of Agriculture.

Eight. Of the Fish Commission.
Nine. Of the Botanic Gardens.
Ten. Of the Coast and Geodetic Survey.
Eleven. Of the Geological Survey.
Twelve. Of the Naval Observatory.

ACT March 3, 1901, c. 831 (31 Stat. 1010)

"* * * That facilities for study and research in the Government Departments, the Library of Congress, the National Museum, the Zoological Park, the Bureau of Ethnology, the Fish Commission, the Botanic Gardens, and similar institutions hereafter established shall be afforded to scientific investigators and to duly qualified individuals, students, and graduates of institutions of learning in the several States and Territories, as well as in the District of Columbia, under such rules and restrictions as the heads of the Departments and Bureaus mentioned may prescribe."

In accorance with the purposes of the Government as above enumerated, the collections and laboratories of the Department of Agriculture from their foundation have been made available to qualified students and investigators as far as it was possible to do so. Many workers from American and foreign universities and colleges have availed themselves of these privileges.

The Graduate School of the Department was organized in 1921. Secretary Henry C. Wallace in his report for 1921 said: "To maintain the efficiency in a scientific organization under Civil Service regulations some provision must be made for adequate training of those who enter the service in the lower positions. * * * To meet this need the Department has provided for graduate training in various lines for the scientific workers. The work is given outside of office hours, is supported entirely by the students, and is therefore unofficial in nature. It is, however, supervised and encouraged by the Department. Everything necessary is done to insure the highest standard for the work, so that it will not only be effective training for the Department workers, but satisfactory to the graduate institutions of the country.. It is expected that the ambitious workers of the Department will make arrangements with such graduate institutions for the acceptance of these credits and will ultimately attend these institutions and complete and work required for advanced degrees. Leaves of absence for this purpose are being arranged and closer cooperation with graduate departments in the solution of research problems is being considered.

Some of the strongest scientists of the Department are taking charge of courses and a few of the leading graduate institutions have furnished teachers for others. Altogether a most helpful spirit has prevailed."

The interest in the school has grown from year to year. Its work has been strengthened and credits granted have been accepted for graduate and undergraduate credit in all institutions where they have been offered. These include many of the leading universities of the country.

The courses include a wide range of subjects, covering nearly the whole field of the work of the Department and the basic sciences involved; also mathematics and languages.

The number registered ranges between 100 and 500 per semester.

Registration is open to any qualified student. Nearly all Departments of the Government and many universities and colleges are represented.

The work is planned by a Graduate School Council, selected from the leading scientists of the Department.

The Director of Scientific Work is Chairman of the Council and Director of the School.

OFFICERS, COUNCIL, AND INSTRUCTIONAL STAFF

Officers

A. F. Woods, B. Sc., A. M., D. Agr., D. Sc., LL.D., Dean and Director of Agriculture, Forestry, and Home Economics, and President of the University of Minnesota in the absence of President Vincent, 1910-17; President of the Maryland State College and of the University of Maryland, 1917-26; Director of Scientific Work of the United States Department of Agriculture 1926-35; Director of Graduate School and Chairman of Council 1926-

M. C. Merrill, S. M., A. M., Ph. D., Chief Division of Publications, Office of Information, Associate Director of the Graduate School, 1934-

Mrs. N. E. Fealy, Secretary and Registrar, 1926-34.

Mrs. Emma M. Wolfe, Secretary and Registrar, 1934-

Mr. J. J. Ackerman, Treasurer.

Graduate Council

Claribel Barnett, Ph. B., B. L. S., Senior Librarian, Librarian U. S. Department of Agriculture.

W. B. Bell, M. S., Ph. D., Principal Biologist in Charge, Division of Biological Investigations, Bureau of Biological Survey.

H. G. Byers, A. B., B. S., A. M., Ph. D., Principal Chemist in Charge of Soil Investigations, Bureau of Chemistry and Soils.

F. G. Cottrell, B. S., M. S., Ph. D., Chief Fertilizer and Fixed Nitrogen Investigations, now with the Research Corporation of New York.

R. O. E. Davis, Ph. B., Ph. D., Senior Chemist, Division, Transformation of Nitrogen Compounds, Bureau of Chemistry and Soils.

M. Dorset, B. S., M. D., D. V. M., Principal Biochemist, Chief Biochemic Division, Bureau of Animal Industry.

M. S. Eisenhower, B. S., Director of Information, Office of Information.

L. C. Gray, A. B., M. A., Ph. D., LL.D., Principal Agricultural Economist in Charge, Division of Land Economics, Bureau of Agricultural Economics.

W. J. Humphreys, A. B., C. E., Ph. D., Principal Meteorologist in Charge Meteorological Physics, Weather Bureau.

James T. Jardine, B. S., C. E., Chief Office of Experiment Stations.

H. G. Knight, B. A., M. A., Ph. D., Chief Bureau of Chemistry and Soils.

A. G. McCall, B. S., Ph. D., Chief of Soil Investigations, Bureau of Chemistry and Soils.

S. H. McCrory, C. E., A. E., Chief Bureau of Agricultural Engineering.

M. C. Merrill, S. M., A. M., Ph. D., Chief Division of Publications, Office of Information.

L. A. Rogers, B. S., D. Sc., Principal Bacteriologist, Chief Division of Dairy Research Laboratories, Bureau of Dairy Industry.

F. X. Schumacher, B. S., Silviculturist, Division of Silvics, Forest Service.

C. B. Smith, M. S., D. Sc., Principal Agriculturist, Chief Office of Cooperative, Extension Work.

Louise Stanley, B. S., B. Ed., A. B., M. A., Ph. D., Chief Bureau of Home Economics.

O. C. Stine, Ph. B., Ph. D., Principal Agricultural Economist in Charge Division of Statistical and Historical Research, Bureau of Agricultural Economics.

W. W. Stockberger, B. S., Ph. D., Director Office of Personnel and Business Administration.

Charles Thom. A. B., A. M., Ph. D., Principal Mycologist in Charge, Soil Microbiology, Bureau of Chemistry and Soils.

C. W. Warburton, B. S. A., D. Sc., Director of Extension Work.

M. B. Waite, B. S., D. Agr., Principal Pathologist, Bureau of Plant Industry.

B. Youngblood, B. S., M. S., Ph. D., Principal Agricultural Economist, Office of Experiment Stations.

Instructional Staff

Ena A. Allen, B. A., M. A., Ph. D., Associate Zoologist, Parasites of Poultry, Bureau of Animal Industry. 1931-32.

C. C. Appleman, Ph. D., Professor of Botany, Plant Pathology, Plant Physiology. Dean of Graduate School, University of Maryland. 1929-30.

Ernst Artschwager, B. S., Ph. D., Pathologist, Division of Sugar Investigations, Bureau of Plant Industry. 1930-32.

A. D. Balls, B. S., Ph. D., Senior Chemist, Food Research Division, Bureau of Chemistry and Soils. 1931-33.

Henry Bartmann, Senior Translator, 1933-34.

L. H. Bean, Z. B., M. A. B., Senior Agricultural Economist Statistics. Statistical Analysis, Bureau of Agricultural Economics. 1926-28, 1929-32.

H. H. Bennett, B. S., Senior Soil Scientist, Soil Erosion Investigations, Bureau of Chemistry and Soils. 1927-29.

S. F. Blake, A. B., A. M., Ph. D., Senior Botanist, Economic and Systematic Botany, Bureau of Plant Industry. 1929-33.

Henry E. Brockway, Senior Translator, Foreign Agricultural Service, Bureau of Agricultural Economics. 1933-34.

Vernon E. Bundy, B. S. Agricultural Editor, Division of Publications, Office of Information, 1932-33.

H. G. Byers, A. B., B. S., A. M., Ph. D., Principal Chemist in Charge, Soil Investigations, Bureau of Chemistry and Soils. 1929-34.

Mrs. Agnes Chase, Associate Botanist, Economic and Systematic Botany, Bureau of Plant Industry. 1926-27.

D. G. Chitwood, A. B., M. S., Ph. D., Associate Zoologist, Miscellaneous Parasites, Bureau of Animal Industry. 1932-34.

E. P. Clark, M. S., Ph. D., Senior Chemist, Insecticidal Plants, Bureau of Chemistry and Soils. 1932-34.

Leland B. Clark, B. S., Assistant in Radiation Research, Smithsonian Institution.

W. Mansfield Clark, A. B., A. M., Ph. D., Professor of Chemistry, Hygienic Laboratory, United States Public Health Service, now Johns Hopkins University. 1926-27.

Nelson Antrim Crawford, M. A., Director of Information, in Charge, Office of Information, 1926-28.

R. O. E. Davis, Ph. B., Ph. D., Senior Chemist, Division of Fertilizer Technology, Bureau of Chemistry and Soils. 1932-33.

W. Edwards Deming, B. S., M. S., Ph. D., Associate Physicist, Division of Physics and Physical Chemistry, Bureau of Chemistry and Soils. 1933-34.

William W. Diehl, B. A., M. S., Associate Pathologist, Bureau of Plant Industry, 1932-33.

Charles Drechsler, B. S., M. S., Ph. D., Pathologist, Diseases of Truck Crops and Ornamentals, Bureau of Plant Industry. 1927-29, 1930-34.

Everett E. Edwards, B. A., A. M., Associate Agricultural Economist, Agricultural History, Division of Statistical and Historical Research, Bureau of Agricultural Economics. 1927-32, 1933-34.

M. J. B. Ezekiel, M. S., Ph. D., Senior Agricultural Economist, Bureau of Agricultural Economics, Economic Adviser to the Secretary, 1926-30.

M. S. Eisenhower, B. S., Director of Information, in Charge Office of Information. 1929-31, 1932-33.

J. R. Fleming, B. S., Assistant Director, Office of Information. 1930-31.

H. L. J. Haller, Ch. E., Ph. D., Senior Chemist, Insecticidal Plants, Bureau of Chemistry and Soils. 1933-34.

Malcolm M. Haring, A. B., A. M., Ph. D., Professor of Chemistry, University of Maryland. 1929-30, 1931-33.

F. J. Hosking, B. S., M. S., Agricultural Economist, Market News Service, Bureau of Agricultural Economics. 1931-34.

Paul. E. Howe, B. S., M. A., Ph. D., Senior Chemist, in Charge Animal Nutrition, Bureau of Animal Industry, 1930-31, 1933-34.

H. B. Humphrey, B. S., Ph. D., Principal Pathologist, Cereal Diseases, Bureau of Plant Industry. 1926-34.

W. J. Humphreys, A. B., C. E., Ph. D., Principal Meteorologist in Charge, Meteorological Physics, Weather Bureau. 1926-27,

M. A. Jull, B. S., A. M., M. Sc., Ph. D., Senior Poultry Husbandman in Charge, Poultry, Bureau of Animal Industry. 1928-29.

W. B. Kemp. Ph. D., Professor of Agronomics and Genetics, Assistant Dean, College of Agriculture, Associate Agronomist, University of Maryland. 1927-33.

C. H. Leineweber, Ph. D., Professor of German, American University. 1928-34.

Burton E. Livingston, B. S., Ph. D., Plant Physiology, Johns Hopkins University. 1928-29.

Curtis F. Marbut, B. S., A. M., LL. D., D. Sc., Principal Soil Scientist in Charge, Soil Survey, Bureau of Chemistry and Soils. 1927-29, 1930-31, 1933-34.

S. H. McCrory, C. E., A. E., Chief Bureau of Agricultural Engineering, 1927-28.

Hugh C. McPhee, B. S., M. S., Sc. D., Senior Animal Husbandman in Charge, Genetics, Bureau of Animal Industry. 1927-28.

M. C. Merrill, S. M., A. M., Ph. D., Chief, Division of Publications, Office of Information. 1931-33.

John F. Moore. LL. B., Attorney, Office of the Solicitor. 1933-34.

S. R. Newell, B. S., M. S., Agricultural Statistician, Crop and Live-stock Reports, Bureau of Agricultural Economics. 1928-29.

C. H. Popenoe, B. S., Associate Entomologist in Charge, Berry Insects, Bureau of Entomology. 1930-32.

C. M. Purves, B. A., M. A., Senior Agricultural Economist, Bureau of Agricultural Economics. 1926-28, 1929-34.

C. F. Sarle, B. S., M. S., Agricultural Statistician, Crop and Live-stock Reports, Bureau of Agricultural Economics. 1928-29, 1930-31.

Edmund C. Shorey, A. B., M. A., D. Sc., Senior Biochemist, Biochemical Investigations of Soils and Fertilizers, Bureau of Chemistry and Soils. 1926-27.

B. R. Stauber, B. A., M. A., Assistant Agricultural Economist,, Land Appraisal and Land Value, Bureau of Agricultural Economics. 1931-34.

Alexander Sturges, B. S., Junior Agricultural Economist, Statistics and Statistical Analysis, Bureau of Agricultural Economics. 1932-34.

Jason R. Swallen, B. A., M. S., Junior Botanist, Grass Investigations, Bureau of Plant Industry. 1927-28.

Charles Thom, A. B., A. M., Ph. D., Principal Mycologist in Charge, Soil Microbiology, Bureau of Chemistry and Soils. 1930-32.

H. R. Tolley, B. S., A. B., Principal Agricultural Economist, Division of Farm Management. 1926-30

L. Volin, A. B., A. M., Ph. D., Assistant Agricultural Economist, Foreign Competition and Demand. 1933-34.

H. J. Wadleigh, B. Sc. (Econ.), M. A., Associate Agricultural Economist, Foreign Agricultural Serivce, Bureau of Agricultural Economics. 1933-34.

M.C. Wilson, B.S.A. Senior Agriculturist

Extension Studies 1932–34.

U. S. DEBARTMENT OF AGRICULTURE

Graduate School

Memorandum for:

Chiefs of Bureaus and Divisions - U. S. Department of Agriculture

THE GRADUATE SCHOOL

The Graduate School of this Department is completing its 14th year at the close of this semester May 15. It was organized in 1921 with the approval of Secretary Henry C. Wallace and has grown each year both in scope and attendance. This year the total registration in about 50 courses will exceed 1500. While the work is officially approved and supervised, the cost is paid by the students and includes a small fee to the instructors, supplies, such as, chairs, tables, blackboards, chalk, paper, special reference books, etc. The school pays its way and has a small reserve to meet emergencies. The school is managed by a director designated by the Secretary to serve without additional compensation and a Council selected by the director from the Chiefs of Bureaus and Divisions and special experts. The teaching staff is selected by the director with the advice of the Council.

No special rooms are assigned to the school. It is, therefore, necessary to use space available after 4:30 P.M. or before 9 A.M. The Chiefs of Bureaus and Divisions have been very helpful in authorizing this. With the increased pressure for room for the regular work it is going to be more difficult to find suitable room for the larger classes 25-30. A class of 30 requires table space sufficient for that number. This is sometimes available in conference rooms or when space is available the school will supply the tables which may also be of service during office hours to those who occupy the room. Mr. A. E. Edwards (BAE) has been designated chairman of the room committee and will cooperate with the director in finding available space for the various classes. May I ask your cooperation in this matter?

The Council would also like suggestions as to special subjects that you would like to see included in the curriculum and recommendation of the men best qualified in your judgment to handle the work. It is expected this year to include some special seminars for advanced workers. No fee will be charged for these, but those attending will be registered and a record kept of the work accomplished.

Trusting that we may have your continued cooperation, I am,

Sincerely yours,

A. F. WOODS
Director, Graduate School

Graduate School, U. S. Dept. of Ag.

Legal authority

U. S. Stat. 27, 395, 1892

"The facilities for research and instruction in Governmental collections now existing or hereafter to be established in the city of Washington shall be accessible to scientific investigators and students"

Petroleum

H.Doc.186. Communication from the President of the United States, transmitting a supplemental estimate of appropriation for the Department of the Interior, in the amount of $300,000, to carry out during the fiscal year 1936 the provisions of the act approved February 22, 1935, entitled "An act to regulate interstate and foreign commerce in petroleum and its products by prohibiting the shipment in such commerce of petroleum and its products produced in violation of State law, and for other purposes."

To Committee on Appropriations and ordered to be printed.

p.7913.

Philippine Independence

Speech of Mr. Tydings on the subject of Philippine Independence. He had inserted in the Record an address which he delivered December 22, 1934, before the Philippine Constitutional Convention.

p.7841-7845.

Power. Rural Areas

Mr. Bone said, "the Emergency Relief Appropriation Act of 1935 carried an appropriation of $100,000,000, which was earmarked for the purpose of rural electrification," etc. In this connection he had printed in the Record a bulletin prepared by the National Popular Government League entitled "Who Will Get The $100,000,000 for Farm Electrification?- Policies for Farmers to Determine and Some Foot Rules for Estimating Honest Costs of Service."

p.7855-7858.

Public Utilities

Mr. Wheeler called the attention of the Senate to the report from the Interstate Commerce Committee on the proposed Public Utilities Act of 1935. Mr. Wheeler said, "I expect to call up the bill for early consideration as soon as I possibly can have it considered by the Senate."

p.7867.

Puerto Rico See Coffee; Meat.

Railroads

S.Res.71. Authorizing an investigation of interstate railroads and affiliates with respect to financing, reorganizations, mergers, and certain other matters.

Reported with additional amendments in the Senate.

p.7839.

Rural Rehabilitation. Alaska.

Mr. Dickinson had printed in the Appendix of the Record "a copy of a letter written by Cyrenus Cole, a former Representative from Iowa, to the Secretary of Agriculture, with reference to the colonization of Alaska." The letter was sent to Secretary Wallace and an appeal was made to him "to do what you can to help stop this further wastage of both men and money."

p.7927.

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U. S. DEPARTMENT OF AGRICULTURE

FINAL ANNOUNCEMENT OF EDUCATIONAL COURSES FOR 1925-26.

The courses will open on the indicated days in the week beginning October 12. Lectures will be given at 4:30 P. M., unless otherwise arranged.

Each course will consist of two lectures per week, unless otherwise stated. Full-year courses cover 30 weeks, and the fee is $25.00, of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. Half-year courses run 15 weeks, unless otherwise stated, and the fee is $15.00, payable in advance. Two half-year courses taken in the same year will be $25.00. Quarter-year courses comprise 15 lectures and the fee is $8.00, payable in advance.

Standard graduate institutions have accepted the credits resulting from satisfactory completion of the graduate credit courses.

Registration will be at the Office of the Director of Scientific Work. The courses described below will be scheduled if sufficient numbers of students make application for them. Prompt sending of applications is urged in order that teacher and students may know what courses will be given.

The East and West Wings are on the Department grounds, at 13th near B St., S. W. Cereal Investigations Building is located at 1306 B St., Bieber Building at 1358 B St., Motion Picture Laboratory at 1363 C St., Bureau of Chemistry at 216 13th St., Crop Estimates at 200 14th St., and Building "F" on west side of 7th, one full block north of B St., all Southwest.

Language and Composition

Elementary Scientific German. (Year). Non-credit course. Dr. Charles Drechsler. Tues. and Thurs., 106 West Wing. Begins with brief review of German grammar and reading general text. Attention will be given mainly to reading scientific text with exercise in translating same into English. A certain amount of collateral reading, in material of special interest to individual students; may be prescribed. Prerequisite: The equivalent of one year of elementary German.

Advanced Scientific French. (Year). Credit course. Dr. H. B. Humphrey. Mon. and Wed., 106 West Wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economies, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's "Le Livre des Champs; "L'industrie"; Jousier's Economic Rurale"; Bonnier's Le Monde Vegetal", etc. Prerequisite: A knowledge of the elements of French grammar and elementary reading.

Agricultural Writing. (1st half). Credit course. Mr. Nelson Antrim Crawford, with special lectures by Dr. M. C. Merrill, Mr. C. E. Gapen, and others. Tues. and Thurs., Motion Picture Lab. Lectures, discussions, and practice in preparing agricultural and other scientific material for publication. Attention will be given to the demands of various types of readers with respect to both subject matter and style. Stress will be laid on means of making scientific data intelligible to farmers and of making farming and the farmer articulate to other groups in the population.

Bulletin Writing. (2nd half). Dr. M. C. Merrill, with special lectures by Mr. Nelson Antrim Crawford and others. Tues. and Thurs., Motion Picture Lab. Lectures, discussions, and practice in the preparation of bulletins from the assembling of the basic data to the reading of the final proofs. The technical and the popular bulletin will each be treated in detail. Attention will also be given to reports of experiments in the technical scientific journals.

Mathematics and Statistics.

Elementary Statisticsl Methods (Yr.). Mr. B. B. Smith. Mon. and Fri., 411 Bieber Bldg. First half: Organization of statistical investigations: analysis of problem, sources of materials, units, representativeness, comparability, accuracy; standard measures of the single series; tabular, mechanical and graphic methods. Second half: Relationships between series; simple linear and curvilinear correlation methods, outline of multiple correlation methods; technique of analysis of time series. As much time as possible will be devoted to the description, discussion and study of the methods and results used in actual statistical investigations.

Advanced Statistical Methods (Yr.) A credit course. Mr. H. R. Tolley, Tu. and Thurs.,411 Bieber Bldg. First half: The development and application of the theory of statistics. A study of correlation, curve fitting, and their applications. Yule's "Introduction to the Theory of Statistics". Prerequisites: Elementary work in statistics and algebra through simultaneous equations. Second half: Analysis of time series; the making and use of index numbers.

Physics and Chemistry

Advanced Crystallography (Year). Credit course. Dr. Edgar T. Wherry. Tues. and Thurs., Room 415, Bureau of Chemistry. First Semester, Geometrical Crystallography. Second semester, Identification of crystals by optical methods. Prerequisites: Elementary crystallography or mineralogy. Trigonometry and elements of analytic geometry. For the second semester, each student will be required to have access to a chemical microscope. (Given as a special course in cooperation with the Chemistry Department of George Washington University, for 3 credit hours to students registered there.)

Acid-Base and Oxidation-Reduction Equilibria. (1st half). A credit course of 15 lectures by Dr. W. Mansfield Clark, of the Hygienic Laboratory. Mon., 224 East Wing. The first six lectures will deal with the elements of acid-base equilibria. These will establish familiarity with the experimental principles and the modes of formulation to be used in dealing with oxidation-reduction equilibria in reversible organic systems. Interconnections between the two types of reversible reactions will be shown. By reason of their number and variety, the applications of the principles will not be treated systematically but will be used as illustrative material. Prerequisites: A fair knowledge of general chemistry, algebra and logarithms.

Genetics

Plant Breeding (Year)Credit course. Leader to be announced. Wed. and Fri., 4:30 P.M., Room 104, Cereal Investigations. (1) The development of plant breeding; (2) fundamental principles; (3) their application to the art of plant improvement, mass selection, pure-line selection, bud selection, hybridization, including the theory of heterosis, and the technique of practical and experimental plant breeding. Seminars will be held, and specialists will discuss special problems.

Plant Science

Botany for the Nontechnical (Year) Non-credit course. Dr. A. S. Hitchcock, Wed. and Fri., Motion Picture Lab. An elementary course for clerical and other workers in scientific units to enable them better to understand the subject matter of correspondence, manuscripts, records and files with which they are dealing. Simple details concerning the structure and life of common plants. Essentials of nomenclature and classification, the meaning of common terms, the Latin names of plants, the economic botany of our common crop plants, especially as to the parts utilized and the common terminology.

Animal Science

Principles of Nutrition (Year, - Seminar once per week). Credit course. Dr. Paul E. Howe. Thur., Room 4-225, Building F. This seminar will cover selected phases of the nutrition of man and animals. Special lecturers will be brought in from time to time if the enrollment justifies. Prerequisite: A course in nutrition.

Agricultural Economics

Marketing and Cooperation. (Year) Credit course. Mr. K. B. Gardner. Mon. and Fri., Room 305, 200 14th St. (First term). Principles of Marketing. Functions, processes, machinery, and costs of marketing, with special emphasis on the distribution of agricultural products. Attention will be given to such problems as market finance, assumption of market risks, functions of middlemen, relation of the state to marketing, cost of marketing, etc. Some outside reading will be required. (Second term) Cooperation in Marketing. Announcements regarding this course will be made later.

OUTSIDE COURSES

The following courses offered by other institutions are listed here for the information of Department employes. Applications for enrollment should be made direct to the institution named.

George Washington University Course

Physics of the Air, including climatology. Dr. W. J. Humphreys, Weather Bureau.

Bureau of Standards Courses

Course C. Electrochemistry. Mr. Blum, et al. First term: General principles. Second term: Applied electrochemistry.

81E 1934

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF AGRICULTURAL ECONOMICS
DEPARTMENT OF AGRICULTURE

ANNOUNCEMENT OF EDUCATIONAL COURSES FOR TERM BEGINNING FEB. 8, 1926.

Date of Opening. Courses will continue on the designated days in the week beginning Monday, February 8, 1926, and run for 15 weeks. The proposed new course in Physical Measurements will be started if and when sufficient preliminary enrollment is obtained.

Registration will be at the Office of the Director of Scientific Work. Tuition for one full-year course, or two half-year courses taken in the same year, is $25.00 of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. For a half-year course the tuition is $15.00, payable in advance. Shorter courses in proportion.

Short Period Students. Field men in Washington for several weeks may be allowed to enter classes for a shorter period than the semester through arrangements with the teacher and the Director of Scientific Work. The charge for such work will be $1.00 per week, but credits will not be granted. Students desiring to enter full-year classes in the second semester should consult the teacher.

Courses offered

The courses listed below are being offered in this second half-year. For full description of all except the course in Physical Measurements, see the "Final Announcement of Educational Courses for 1925-26," which may be had on application to the Director of Scientific Work. For full description of the course in Physical Measurements see attached sheet. New students may attend any course for two or three lectures without obligating themselves to pay tuition, but they should sign and transmit an application slip immediately.

Elementary Scientific German. (Year). Non-credit course. Dr. Charles Drechsler. Tues. and Thurs. 106 West Wing.

Advanced Scientific French. (Year). Credit course. Dr. H. B. Humphrey. Mon. and Wed. 106 West Wing.

Bulletin Writing. (Half Year). Dr. M. C. Merrill, with special lectures by Mr. Nelson Antrim Crawford and others. Tues. and Thurs., Motion Picture Laboratory. Lectures, discussions, and practice in the preparation of bulletins from the assembling of the basic data to the reading of the final proofs. The technical and the popular bulletin will each be treated in detail. Attention will also be given to reports of experiments in the technical scientific journals.

Elementary Statistical Methods. (Year). Mr. E. M. Daggit (vice Mr. B. B. Smith, resigned) Mon. and Fri., 411 Bieber Bldg.

Advanced Statistical Methods. (Year). A credit course. Mr. H. R. Tolley, Tues. and Thurs., 411 Bieber Bldg.

Advanced Crystallography. (Year). Credit course. Dr. Edgar T. Wherry. Tues. and Thurs., Room 415, Bureau of Chemistry.

Physical Measurements. (Half year). Credit course. Dr. Paul R. Heyl and other members of the staff of the Bureau of Standards. See full announcement attached. Fifteen lectures, or one per week during the semester. Can be given on either Mondays, Tuesdays, or Wednesdays. Indicate choice of day when making application. To be given at the Department of Agriculture. Place of meeting to be announced when day selected is known. This course is offered especially for workers in biology.

Botany for the Nontechnical. (Year) Non-credit course. Dr. A. S. Hitchcock, Wed. and Fri., Cereal Investigations, 1306 B St., S. W.

Principles of Nutrition. (Year,- seminar once per week). Credit course. Dr. Paul E. Howe. Thurs., Room 4-225, Building F.

Courses discontinued

The following courses, included in the announcements for the year, either were not given or do not continue beyond the first half.

Acid-Base and Oxidation-Reduction Equilibria. (1st half only)

Plant Breeding. (not given)

Marketing and Cooperation. (not given)

PHYSICAL MEASUREMENTS

Syllabus of Fifteen Lectures

1. Weight. The balance - adjustment and care - three methods of weighing, and when each is particularly applicable. Errors in weighing - reduction to vacuum.
Balance for small weight - assay balance - micro-balance.

2. Volume. Calibration of burette - pipette - flask. Volume of irregular body.

Density. Substances lighter, heavier than water - soluble in water - porder - minute single fragment. Liquids - bottle, hydrometer, immersed solid.

3. Properties of Matter. Hardness - scratch test - Brinell test - scleroscope. Surface tension - capillarity - contact angle - weight of drop.

Viscosity, Elasticity, Osmotic Pressure. (Will perhaps require two lectures.)

4. Length. Micrometer - optical micrometer - interferometer. Special devices for setting on difficult objects.

5. Thermometry. Liquid and gas thermometers - absolute scale of temperature - calibration of a thermometer. Electrical thermometers - resistance - thermocouples. High temperature measurements, - optical - calorimetric.

6. Heat. Units of heat - specific heat - latent heat - calorimetric measurements mixture - ice and steam calorimeters.

7. Light. Theory - nature of light - invisible light - methods of working with ultra red and ultra violet light - use of quartz, fluorspar and rock salt.
Total reflection - double refraction - diffraction.
The spectroscope - prism - grating - echelon.

8. Optical Instruments. Microscope - ultra-microscope - refractometers - polariscopes.

9. Color and Colorimetry.

10,11,12. Electricity, Elementary Theory - ampere - volt - ohm - coulomb - farad - henry - watt. Ohm's Law - analogous formula for alternating currents. Power factor defined. Electrical Instruments. Galvanometer - electroscope - ammeter - voltmeter - coulometer - watt meter - potentiometer - resistance bridge.

13. X-Rays.

14. Batteries. - primary - secondary - standard cells. Rectifiers - mechanical - chemical - vacuum tubes.

15. Ionization and pH measurements.

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LIBRARY
BUREAU OF
AGRICULTURAL ECONOMICS
U. S. DEPARTMENT OF AGRICULTURE

U. S. DEPARTMENT OF AGRICULTURE

FINAL ANNOUNCEMENT OF EDUCATIONAL COURSES FOR 1926-27.

The courses will open on the indicated days in the week beginning October 11. Lectures will be given at 4:30 P.M., unless otherwise arranged.

Each course will consist of two lectures per week, unless otherwise stated. Full-year courses cover 30 weeks, and the fee is $25.00, of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. Half-year courses run 15 weeks, unless otherwise stated, and the fee is $15.00, payable in advance. Two half-year courses taken in the same year will be $25.00. Quarter-year courses comprise 15 lectures and the fee is $8.00, payable in advance.

Standard graduate institutions have accepted the credits resulting from satisfactory completion of the graduate credit courses.

Registration will be at the Office of the Director of Scientific Work. The courses described below will be scheduled if sufficient numbers of students register for them. Prompt registration is urged in order that teacher and students may know what courses will be given. The courses marked with an asterisk (*) have not yet a sufficient number of registrants.

The East and West Wings are on the Department grounds, at 13th near B St., S. W. Cereal Investigations Building is located at 1306 B St., Bieber Building, at 1358 B St., Motion Picture Laboratory at 1363 C St., Bureau of Chemistry at 216 13th St., Crop Estimates at 200 14th St., and Building "F" on west side of 7th St., two full blocks north of B St., all Southwest.

Language and Composition

*Elementary Scientific French (Year). Non-credit course. Dr. H. B. Humphrey. Mon. and Wed., 106 West Wing. A course in elementary French with special emphasis on the acquisition of a working vocabulary of words commonly used in scientific publications. Preparation for reading scientific and technical articles in French. Text-book: Moffatt's Science French Course. Prerequisite: An elementary knowledge of French grammar.

*The Literature of Rural Life (2nd half). Credit course. Mr. Nelson Antrim Crawford. (Time and place to be announced at beginning of second semester) Reading, lectures, and discussions of the literature of rural life from early times to the present, with emphasis on contemporary writing in this field. Fiction, poetry, drama, and other expressions of the life of the country will be treated. The purposes will be both to develop an understanding of the farmer's mind and of the philosophy of rural life, and to build a sound basis for literary appeal to the farmer and for interpreting agriculture and rural life to city people.

Mathematics and Statistics

Elementary Statistical Methods (Year). Non-credit course. Mr. C. M. Purvis. Mon. and Fri., 411 Bieber Bldg. First half: Organization of statistical investigations; analysis of problem, sources of materials, units, representativeness, comparability, accuracy; standard measures of the single series; tabular, mechanical, and graphic methods. Second half: Relationships between series; simple linear and curvilinear correlation methods, outline of multiple correlation methods; technique of analysis of time series.

As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

Advanced Statistical Methods (Year). Credit course. Mr. H. R. Tolley, assisted by Mr. M. J. B. Ezekiel. Tues. and Thurs., 411 Bieber Bldg. First half: The development and application of the theory of statistics. A study of correlation, curve fitting, and their applications. Yule's "Introduction to the Theory of Statistics." Prerequisites: Elementary work in statistics and algebra through simultaneous equations. Second half: Theory of sampling and its application to the collection and analysis of statistical data.

* Review of Mathematics. (Year). Non-credit course. Mr. E. W. Woolard. Tues. and Thurs., 500 Crop Estimates. First half: Review of mathematics up to calculus, including algebra, trigonometry, and analytical geometry. Second half: Differential and integral calculus.

Physics and Chemistry

* The Biochemistry of Soils (1st half). Credit course. Dr. Edmund C. Shorey. Wed. and Fri., 224 East Wing. Preliminary lectures on general biochemistry. The chemistry of the organic material that is added to soils in their formation and cultivation, and the changes that this material undergoes in the soil. The application of biochemical methods to the isolation and identification of the organic constituents of soils. Significance of the results obtained and importance of further research. Prerequisite: At least one year general chemistry.

Acid-Base and Oxidation-Reduction Equilibria (Year). A credit course of 30 lectures by Dr. W. Mansfield Clark of the Hygienic Laboratory. Mon., 224 East Wing. The purpose of this course is to give the student that theoretical knowledge which should enable him first to understand the indicator and the potentiometric methods of determining hydrogen-ion concentrations on the one hand and oxidation, reduction potentials on the other; and, second, to acquire a sense of intellectual pleasure in studying applications already made and in designing new applications in biochemistry and technology. While specific applications will not be discussed in detail, principles will be illustrated by well established and most recent applications

in a wide variety of subjects. The first 10 lectures will be confined to the more elementary aspects of the two interrelated subjects in order that the remaining 20 lectures may serve as an extension to the course given last year. Prerequisite: A fair knowledge of the elements of chemistry, physics, algebra, and logarithms.

Plant Science

* Botany for the Nontechnical (Year). Non-credit course. Mrs. Agnes Chase. Mon. and Thurs., Cereal Investigations. An elementary course for clerical and other non-scientific workers in scientific units to enable them better to understand the subject matter of correspondence, manuscripts, records, and files with which they are dealing, and the general relation of plant life to man. Simple details concerning the structure and life of common plants. Essentials of nomenclature and classification, the meaning of common terms, the Latin names of plants, the economic botany of our common crop plants, especially as to the parts utilized and the common terminology. Part of the work may be given out of doors.

Agricultural Economics

* Prices and Price Relationships (Year). Credit course. Mr. L. H. Bean and Mr. M. J. B. Ezekiel. Mon. and Wed., 500 Crop Estimates. First half: Price Movements and Business Cycles. Significance of prices in the economic organization of society; different kinds of prices and what they mean; interrelationships of price movements, with respect to the general changes in price level, groups of commodities, and international price movements; and the business cycle, with respect to industrial and agricultural production, changes in trade, transportation, and finance, consumption of raw and finished goods, and prices of production and consumption goods.

Second half: Economic Basis of Price Analysis. Examination of what prices are, with regard to different methods of arriving at prices, and different methods of recording prices; different points of view in price analysis, distinguishing between the effect of supply upon price, the effect of price upon subsequent supply, and the effect of price upon consumption; the time factor in price analysis, with regard to meaning of price trends, periodic variations in prices and seasonal variations in prices; the price level factor in price analysis, dynamic factors in price analysis; and uses of price analysis.

Prospective students should have a knowledge of elementary statistics. Enough laboratory work will be given to provide concreteness to the principles discussed, but no effort will be made to teach details of technical statistics.

OUTSIDE COURSES

The following courses offered by other institutions are listed here for the information of Department employees. Applications for enrollment should be made direct to the institution named.

George Washington University Course

Physics of the Air. Dr. W. J. Humphreys, Weather Bureau.

Bureau of Standards Courses

Course A. Theoretical Mechanics. Dr. P. R. Heyl. A full course of sixty lectures given two hours per week, Tue. and Fri. at 4:30. Text: Webster's Dynamics, with references to other texts on special subjects. Emphasis will be laid on a graduated series of practical problems illustrative of the text. The course will include a study of the theory of the gyroscope and its application to the gyrocompass.

Course B. Theory of Functions. Dr. C. Snow. A full course of sixty lectures given two hours per week, Tue. and Thu. at 8:00 A. M. Fundamental theory of a complex variable illustrated by applications to problems in electricity, mechanics, and heat conduction.

Course C Theoretical Chemistry of Sugars. Dr. C. S. Hudson. A half course of thirty lectures given one hour a week, Tuesday at 4:30. General properties and reactions of the sugars and their principal derivatives, their stereochemical structures, and their syntheses.

Course D. Mathematical Theory of Elasticity. Dr. Tobias Dantzig. A full course of sixty lectures given two hours per week, Mon. and Wed. at 4:30, in the conference room (No. 353) Industrial Building. Intended primarily for materials and structural engineers.

Course E. Scientific German. Prof. A. S. Wright. Mon. and Wed. at 4:30, large lecture room (No. 414) East Building. This is a full course consisting of sixty sessions. The text used will be Wright's "German Science Reader," published by Holt and Company. Designed to develop a good reading knowledge of scientific German. Prerequisite: An elementary knowledge of German grammar.

Course F. Ceramic Petrography. Dr. H. Insley. Mon. and Thu. at 8:00 A. M., Room 270, Industrial Building. The first meeting will be Monday, October 11, in the lecture room (No. 353) Industrial Building. A laboratory course in the use of the petrographic microscope in the identification of ceramic materials.

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UNITED STATES DEPARTMENT OF AGRICULTURE
Director of Scientific Work
Washington

January 27
1927

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AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGR.

The second semester of the six Graduate School courses now under way will begin as follows:

January 31--Acid-base and Oxidation-reduction Equilibria.
February 3--Review of Mathematics.

February 4--Elementary Statistical Methods.

February 14-Elementary Scientific French.

February 14-Pricesand Price Relationships.

February 15-Advanced Statistical Methods.

New classes will be formed in any of the other courses mentioned in the attached announcement if there is sufficient demand.

Prospective students should communicate promptly with the Office of--

A. F. Woods,
Director of Scientific Work.

U. S. DEPARTMENT OF AGRICULTURE

FINAL ANNOUNCEMENT OF EDUCATIONAL COURSES FOR 1926-27.

The courses will open on the indicated days in the week beginning October 11. Lectures will be given at 4:30 P.M., unless otherwise arranged.

Each course will consist of two lectures per week, unless otherwise stated. Full-year courses cover 30 weeks, and the fee is $25.00, of which $15.00 is payable at time of registration and $10.00 at the beginning of the second half-year. Half-year courses run 15 weeks, unless otherwise stated, and the fee is $15.00, payable in advance. Two half-year courses taken in the same year will be $25.00. Quarter-year courses comprise 15 lectures and the fee is $8.00, payable in advance.

Standard graduate institutions have accepted the credits resulting from satisfactory completion of the graduate credit courses.

Registration will be at the Office of the Director of Scientific Work. The courses described below will be scheduled if sufficient numbers of students register for them. Prompt registration is urged in order that teacher and students may know what courses will be given. The courses marked with an asterisk (*) have not yet a sufficient number of registrants.

The East and West Wings are on the Department grounds, at 13th near B St., S. W. Cereal Investigations Building is located at 1306 B St., Bieber Building, at 1358 B St., Motion Picture Laboratory at 1363 C St., Bureau of Chemistry at 216 13th St., Crop Estimates at 200 14th St., and Building "F" on west side of 7th St., two full blocks north of B St., all Southwest.

Language and Composition

*Elementary Scientific French (Year). Non-credit course. Dr. H. B. Humphrey. Mon. and Wed., 106 West Wing. A course in elementary French with special emphasis on the acquisition of a working vocabulary of words commonly used in scientific publications. Preparation for reading scientific and technical articles in French. Text-book: Moffatt's Science French Course. Prerequisite: An elementary knowledge of French grammar.

*The Literature of Rural Life (2nd half). Credit course. Mr. Nelson Antrim Crawford. (Time and place to be announced at beginning of second semester) Reading, lectures, and discussions of the literature of rural life from early times to the present, with emphasis on contemporary writing in this field. Fiction, poetry, drama, and other expressions of the life of the country will be treated. The purposes will be both to develop an understanding of the farmer's mind and of the philosophy of rural life, and to build a sound basis for literary appeal to the farmer and for interpreting agriculture and rural life to city people.

Mathematics and Statistics

Elementary Statistical Methods (Year). Non-credit course. Mr. C. M. Purvis. Mon. and Fri., 411 Bieber Bldg. First half: Organization of statistical investigations; analysis of problem, sources of materials, units, representativeness, comparability, accuracy; standard measures of the single series; tabular, mechanical, and graphic methods. Second half: Relationships between series; simple linear and curvilinear correlation methods, outline of multiple correlation methods; technique of analysis of time series.

As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

Advanced Statistical Methods (Year). Credit course. Mr. H. R. Tolley, assisted by Mr. M. J. B. Ezekiel. Tues. and Thurs., 411 Bieber Bldg. First half: The development and application of the theory of statistics. A study of correlation, curve fitting, and their applications. Yule's "Introduction to the Theory of Statistics." Prerequisites: Elementary work in statistics and algebra through simultaneous equations. Second half: Theory of sampling and its application to the collection and analysis of statistical data.

* Review of Mathematics. (Year). Non-credit course. Mr. E. W. Woolard. Tues. and Thurs., 500 Crop Estimates. First half: Review of mathematics up to calculus, including algebra, trigonometry, and analytical geometry. Second half: Differential and integral calculus.

Physics and Chemistry

* The Biochemistry of Soils (1st half). Credit course. Dr. Edmund C. Shorey. Wed. and Fri., 224 East Wing. Preliminary lectures on general biochemistry. The chemistry of the organic material that is added to soils in their formation and cultivation, and the changes that this material undergoes in the soil. The application of biochemical methods to the isolation and identification of the organic constituents of soils. Significance of the results obtained and importance of further research. Prerequisite: At least one year general chemistry.

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in a wide variety of subjects. The first 10 lectures will be confined to the more elementary aspects of the two interrelated subjects in order that the remaining 20 lectures may serve as an extension to the course given last year. Prerequisite: A fair knowledge of the elements of chemistry, physics, algebra, and logarithms.

Plant Science

* Botany for the Nontechnical (Year). Non-credit course. Mrs. Agnes Chase. Mon. and Thurs., Cereal Investigations. An elementary course for clerical and other non-scientific workers in scientific units to enable them better to understand the subject matter of correspondence, manuscripts, records, and files with which they are dealing, and the general relation of plant life to man. Simple details concerning the structure and life of common plants. Essentials of nomenclature and classification, the meaning of common terms, the Latin names of plants, the economic botany of our common crop plants, especially as to the parts utilized and the common terminology. Part of the work may be given out of doors.

Agricultural Economics

* Prices and Price Relationships (Year). Credit course. Mr. L. H. Bean and Mr. M. J. B. Ezekiel. Mon. and Wed., 500 Crop Estimates.
First half: Price Movements and Business Cycles. Significance of prices in the economic organization of society; different kinds of prices and what they mean; interrelationships of price movements, with respect to the general changes in price level, groups of commodities, and international price movements; and the business cycle, with respect to industrial and agricultural production, changes in trade, transportation, and finance, consumption of raw and finished goods, and prices of production and consumption goods.
Second half: Economic Basis of Price Analysis. Examination of what prices are, with regard to different methods of arriving at prices, and different methods of recording prices; different points of view in price analysis, distinguishing between the effect of supply upon price, the effect of price upon subsequent supply, and the effect of price upon consumption; the time factor in price analysis, with regard to meaning of price trends, periodic variations in prices and seasonal variations in prices; the price level factor in price analysis, dynamic factors in price analysis; and uses of price analysis.
Prospective students should have a knowledge of elementary statistics. Enough laboratory work will be given to provide concreteness to the principles discussed, but no effort will be made to teach details of technical statistics.

OUTSIDE COURSES

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Bureau of Standards Courses

Course A. Theoretical Mechanics. Dr. P. R. Heyl. A full course of sixty lectures given two hours per week, Tue. and Fri. at 4:30. Text: Webster's Dynamics, with references to other texts on special subjects. Emphasis will be laid on a graduated series of practical problems illustrative of the text. The course will include a study of the theory of the gyroscope and its application to the gyrocompass.

Course B. Theory of Functions. Dr. C. Snow. A full course of sixty lectures given two hours per week, Tue. and Thu. at 8:00 A. M. Fundamental theory of a complex variable illustrated by applications to problems in electricity, mechanics, and heat conduction.

Course C. Theoretical Chemistry of Sugars. Dr. C. S. Hudson. A half course of thirty lectures given one hour a week, Tuesday at 4:30. General properties and reactions of the sugars and their principal derivatives, their stereochemical structures, and their syntheses.

Course D. Mathematical Theory of Elasticity. Dr. Tobias Dantzig. A full course of sixty lectures given two hours per week, Mon. and Wed. at 4:30, in the conference room (No. 353) Industrial Building. Intended primarily for materials and structural engineers.

Course E. Scientific German. Prof. A. S. Wright. Mon. and Wed. at 4:30, large lecture room (No. 414) East Building. This is a full course consisting of sixty sessions. The text used will be Wright's "German Science Reader," published by Holt and Company. Designed to develop a good reading knowledge of scientific German. Prerequisite: An elementary knowledge of German grammar.

Course F. Ceramic Petrography. Dr. H. Insley. Mon. and Thu. at 8:00 A. M., Room 270, Industrial Building. The first meeting will be Monday, October 11, in the lecture room (No. 353) Industrial Building. A laboratory course in the use of the petrographic microscope in the identification of ceramic materials.

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1927

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GRADUATE SCHOOL

U. S. DEPARTMENT OF AGRICULTURE

1927-28.

PRELIMINARY ANNOUNCEMENT

The Graduate School of the Department of Agriculture will start its various courses for the first semester of 1927-28 during the week beginning Monday, October 17. The classes will begin at 4:30 p. m. and will be held in the Department buildings, as indicated. Tuition will be, as heretofore, $25 for the two semesters of 30 hours each or $15 for the first semester and $10 for the second, payment for each semester to be made in advance.

To enable us to determine what courses are desired by those wishing to avail themselves of the opportunities for advancement afforded by the Graduate School the following lists of subjects are submitted. Each prospective applicant is requested to check on these lists the course or courses in which interested, give name and office address on the blank following the lists, and return the document to the Director of Scientific Work. If interested in subjects other than those included in the lists please indicate same in the space for that purpose. Prompt returns are requested.

As soon as we determine from the returns what courses will be given final announcement, giving days and places the classes will be held, will be sent out, and those interested may then register at the Office of the Director of Scientific Work.

A. F. Woods,
Director of Scientific Work,
In Charge of Graduate School.

SUGGESTED COURSES WITH NAMES OF INSTRUCTORS

ELEMENTARY STATISTICAL METHODS (year). Non-credit course. Mr. C. M. Purvis, Monday and Friday, 411 Bieber Building:

First semester.--The organization of statistical investigations; the use of sampling; analysis of problem, sources of materials, units; graphic methods; tabular construction; the methods, analysis, and presentation of measures describing single series. Considerable time will be spent analyzing samples, showing the methods of editing samples, testing for accuracy, and the relation between size of sample and the probable error of the results.

Second semester.--Relations between series; simple linear and curvilinear correlation methods, outline of multiple correlation methods; technique of analysis of time series. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

ADVANCED STATISTICAL METHODS (year). Credit course. Mr. H. R. Tolley and Mr. M. J. B. Ezekiel. Tuesday and Thursday, 411 Bieber Building:

First semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work; Yule's "Introduction to the Theory of Statistics." Prerequisites, elementary work in statistics and algebra through simultaneous equations.

Second semester.--Theory of sampling and its application to the collection and analysis of statistical data.

REVIEW OF MATHEMATICS (year). Non-credit course. Mr. E. W. Woolard. Tuesday's and Thursdays, No. 500 Crop Estimates:

First semester.--Review of mathematics up to calculus, including algebra, trigonometry, and analytical geometry.

Second semester.--Differential and integral calculus.

PRICES AND PRICE RELATIONSHIPS (year). Credit course. Mr. L. H. Bean and Mr. M. J. B. Ezekiel. Monday and Wednesday. No. 500 Crop Estimates:

First semester.--Price movements and business cycles: Significance of prices in the economic organization of society; different kinds of prices and what they mean; interrelationships of price movements with respect to the general changes in price level, groups of commodities, and international price movements;

the business cycle, its causes and characteristics, its relation to agricultural and non-agricultural price cycles, and to industrial and agricultural production; changes in trade, transportation, and finance, consumption of raw and finished goods, and prices of production and consumption goods.

Second semester.--Economic basis of price analysis: Examination of what prices are with regard to different methods of arriving at prices and different methods of recording prices; different points of view in price analysis, distinguishing between the effect of supply upon price, the effect of price upon subsequent supply, and the effect of price upon consumption; the time factor in price analysis with regard to meaning of price trends, periodic variations in prices and seasonal variations in prices; the price level factor in price analysis, dynamic factors in price analysis; and uses of price analysis. Prospective students should have a knowledge of elementary statistics. Sufficient laboratory work will be given to provide concreteness to the principles discussed, but no effort will be made to teach details of technical statistics.

ADVANCED CRYSTALLOGRAPHY (year). Credit course. Dr. Edgar T. Wherry. (Time and place for holding classes to be announced in final announcement.)

First semester.--Geometrical crystallography.

Second semester.--Identification of crystals by optical methods. Prerequisites are elementary crystallography or mineralogy, and trigonometry and elements of analytic geometry. For the second semester each student will be required to have access to a chemical microscope. (To be given as a special course in cooperation with the Chemistry Department of George Washington University, for 3 credit hours to students registered there.)

HISTORY OF AMERICAN AGRICULTURE (one semester). Credit course. Mr. Everett E. Edwards. Time and place of holding classes will be announced in final announcement.

First semester.--A consideration of the main facts, forces, and conditions which have entered into the development of agriculture in the United States since the first settlement, together with indication of the extent to which the major problems of our national life have been agricultural. This will bring the changes, the trends, and the ways in which adjustments have been made into relief and helps explain the genesis of present agricultural life. The aim is to give this historical information to facilitate the work of and increase the interest of those engaged in solving rural problems.

BIOCHEMICAL METHODS (one semester). Credit course. Dr. Edmund C. Shorey. Wednesday and Friday, 224 East Wing.

First semester.--Preliminary lectures on biochemistry; general biochemical methods; special biochemical methods; application of methods; special problems. Prerequisite, at least one year's general chemistry.

PLANT AND ANIMAL GENETICS (year). Credit course. Mr. W. B. Kemp first semester and Dr. Hugh C. McPhee second semester. Time and place of holding classes will be announced in final announcement:

First semester.--The history and the present practice of plant breeding with genetic principles that underlie this practice as applied to plants that are self-fertilized, open-fertilized, and propagated by asexual means. Also a detailed study of type cases to learn the extent of artificial improvement, means for measuring this improvement, and comparative results obtained by use of the different breeding methods.

Second semester.--A brief review of the physical basis of heredity; inheritance in farm animals; variations and mutations; sex determination; inbreeding and crossbreeding; selection. If time permits a discussion will be given of the animal breeding projects which are now being carried on at various places in this country.

BOTANY FOR THE NONTECHNICAL (year). Non-credit course. Mrs. Agnes Chase. Monday and Thursday. Place will be announced in final announcement. An elementary course for clerical and other non-scientific workers in scientific units to enable them better to understand the subject matter of correspondence, manuscripts, records, and files with which they are dealing, and the general relation of plant life to man; simple details concerning the structure and life of common plants; essentials of nomenclature and classification, the meaning of common terms, the Latin names of plants, the economic botany of our common crop plants, especially as to the parts utilized and the common terminology. Part of the work may be given out of doors.

SOIL GENESIS, CLASSIFICATION, EROSION, AND FLOOD CONTROL (one semester). Credit course, Mr. H. H. Bennett and Mr. S. H. McCrory.

Second semester.--The purpose of this course is to explain the new concept of soils and to set forth the problems of soil erosion and flood control. The genetic concept of soils; the basis and principles of soil classification; and the classification of the soils of the United States and of the world; soil erosion as a national problem; erosion and its relation to soil types, its effects on agriculture, and methods of occurrence, prevention, and control; flood control.

SCIENTIFIC FRENCH (year) Credit course. Dr. H. B. Humphrey. Monday and Wednesday, 106 West Wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie," Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Perquisite, a knowledge of the elements of French grammar and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year). Non-credit course. Dr. Charles Drechsler. Reading and translation of German scientific prose with some individual work in the preparation of a finished translation of an article in the particular field in which the student may be more directly interested (20 to 30 pages); review of German throughout. Perquisite, an elementary knowledge of German.

THE LITERATURE OF RURAL LIFE (second semester). Credit course. Mr. Nelson Antrim Crawford. Days and place of holding classes will appear in final announcement. Reading, lectures, and discussions of the literature of rural life from early times to the present, with emphasis on contemporary writing in this field. Fiction, poetry, drama, and other expressions of the life of the country will be treated. The purpose will be both to develop an understanding of the farmer's mind and of the philosophy of rural life, and to build a sound basis for literary appeal to the farmer and for interpreting agriculture and rural life to city people.

GEORGE WASHINGTON UNIVERSITY COURSE

PHYSICS OF THE AIR. Dr. W. J. Humphreys, Weather Bureau.

BUREAU OF STANDARDS COURSES

These will appear in the final announcement.

Dr. A. F. Woods,
Director of Scientific Work,
In Charge of Graduate School.

Dear Doctor Woods:

I am interested in the courses checked in the foregoing list. I would also be interested in courses in the following subjects:

.....

.....

.....

(Name).....

(Office address).....

MISS LACY.

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE
1927-28

FINAL ANNOUNCEMENT

The Graduate School of the Department of Agriculture will open its seventh year the week beginning October 17. Classes will be held on the dates and at the places indicated below and will start at 4:30 or as soon thereafter as the members can assemble. Tuition is $25 for the two semesters of 30 hours each or $15 for one semester, payment for each semester to be made in advance. Applicants will register in the Office of the Director of Scientific Work.

Standard graduate institutions accept the credits resulting from satisfactory completion of the graduate credit courses.

COURSES WHICH WILL BE GIVEN

(1) Elementary Statistical Methods (year). Non-credit course. Mr. C. M. Purvis. Mondays and Fridays, beginning October 17. Room 411, Bieber Building, B St., near 14th, S.W.

(2) Advanced Statistical Methods (year). Credit course. Mr. H. R. Tolley and Mr. M.J.B. Ezekiel. Tuesdays and Thursdays, beginning October 18. Room 411 Bieber Building, B St., near 14th, S.W.

(3) Review of Mathematics (year). Non-credit course. Mr. E. W. Woolard. Tuesdays and Thursdays, beginning October 18. Room 500, Crop Estimates (fifth floor), 200 14th St., S.W.

(4) Prices and Price Relationships (year). Credit course. Mr. L. H. Bean and Mr. M.J.B. Ezekiel. Mondays and Wednesdays, beginning October 17. Room 500, Crop Estimates (fifth floor), 200 14th St., S.W.

(5) Botany for the Non-technical (year). Non-credit course. Mr. Jason R. Swallen. Mondays and Fridays, beginning October 17. Projection Room, Motion Picture Laboratory, 1363 C St., S.W.

(6) Scientific French (year). Credit course. Dr. H. B. Humphrey. Mondays and Wednesdays, beginning October 17. Room 106, West Wing.

(7) Intermediate Scientific German (year). Non-credit course. Dr. Charles Drechsler. Tuesdays and Thursdays, beginning October 18. Projection Room, Motion Picture Laboratory, 1363 C St., S.W.

(8) History of American Agriculture (first semester only). Credit course. Mr. Everett E. Edwards. Tuesdays and Thursdays, beginning October 18. Room 223-224 East Wing.

(9) Soil Genesis, Classification, Erosion, and Flood Control (second semester only). Credit course. Dr. Curtis F. Marbut, Soil Genesis and Soil Classification, 20 periods; Mr. H. H. Bennett and Mr. S. H. McCrory, Erosion and Flood Control, 10 periods. Mondays and Wednesdays, first meeting January 30. Room 311, Building F, 7th St.

(10) The Literature of Rural Life (second semester only). Credit course. Mr. Nelson Antrim Crawford. First meeting Wednesday, February 1. Room 102, 215 13th St., S.W.

COURSE WHICH WILL BE GIVEN
in case a sufficient number registers.

(11) Plant and Animal Genetics (year). Credit course. Mr. W. B. Kemp, Plant Genetics, first semester; Dr. Hugh C. McPhee, Animal Genetics, second semester. Mondays and Wednesdays. Room 223-224, East Wing.

DESCRIPTION OF COURSES

ELEMENTARY STATISTICAL METHODS (year). Non-credit course. Mr. C. M. Purvis, Monday and Friday, 411 Bieber Building:

First semester.--The organization of statistical investigations; the use of sampling; analysis of problem, sources of materials, units; graphic methods; tabular construction; the methods, analysis, and presentation of measures describing single series. Considerable time will be spent analyzing samples, showing the methods of editing samples, testing for accuracy, and the relation between size of sample and the probable error of the results.

Second semester.--Relations between series; simple linear and curvilinear correlation methods, outline of multiple correlation methods; technique of analysis of time series. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

ADVANCED STATISTICAL METHODS (year). Credit course. Mr. H. R. Tolley and Mr. M. J. B. Ezekiel. Tuesday and Thursday, 411 Bieber Building:

First semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work; Yule's "Introduction to the Theory of Statistics." Prerequisites, elementary work in statistics and algebra through simultaneous equations.

Second semester.--Theory of sampling and its application to the collection and analysis of statistical data.

REVIEW OF MATHEMATICS (year). Non-credit course. Mr. E. W. Woolard. Tuesday's and Thursdays, No. 500 Crop Estimates:

First semester.--Review of mathematics up to calculus, including algebra, trigonometry, and analytical geometry.

Second semester.--Differential and integral calculus.

PRICES AND PRICE RELATIONSHIPS (year). Credit course. Mr. L. H. Bean and Mr. M. J. B. Ezekiel. Monday and Wednesday, No. 500 Crop Estimates:

First semester.--Price movements and business cycles: Significance of prices in the economic organization of society; different kinds of prices and what they mean; interrelationships of price movements with respect to the general changes in price level, groups of commodities, and international price movements; the business cycle, its causes and characteristics, its relation to agricultural and non-agricultural price cycles, and to industrial and agricultural production; changes in trade, transportation, and finance, consumption of raw and finished goods, and prices of production and consumption goods.

Second semester.--Economic basis of price analysis: Examination of what prices are with regard to different methods of arriving at prices and different methods of recording prices; different points of view in price analysis, distinguishing between the effect of supply upon price, the effect of price upon subsequent supply, and the effect of price upon consumption; the time factor in price analysis with regard to meaning of price trends, periodic variations in prices and seasonal variations in prices; the price level factor in price analysis, dynamic factors in price analysis; and use of price analysis. Prospective students should have a knowledge of elementary statistics. Sufficient laboratory work will be given to provide concreteness to the principles discussed, but no effort will be made to teach details of technical statistics.

BOTANY FOR THE NONTECHNICAL (year). Non-credit course. Mr. Jason R. Swallen. Monday and Friday. Projection Room, Motion Picture Laboratory, 1363 C St. S.W. An elementary course for clerical and other non-scientific workers in scientific units to enable them better to understand the subject matter of correspondence, manuscripts, records, and files with which they are dealing, and the general relation of plant life to man; simple details concerning the structure and life of common plants; essentials of nomenclature and classification, the meaning of common terms, the Latin names of plants, the economic botany of our common crop plants, especially as to the parts utilized and the common terminology. Part of the work may be given out of doors.

SCIENTIFIC FRENCH (year) Credit course. Dr. H. B. Humphrey. Monday and Wednesday, 106 West Wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie," Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Perquisite, a knowledge of the elements of French grammar and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year). Non-credit course. Dr. Charles Drechsler. Tuesday and Thursday. Projection Room, Motion Picture Laboratory, 1363 C St., S.W. Reading and translation of German scientific prose with some individual work in the preparation of a finished translation of an article in the particular field in which the student may be more directly interested (20 to 30 pages); review of German throughout. Perquisite, an elementary knowledge of German.

HISTORY OF AMERICAN AGRICULTURE (first semester only). Credit course. Mr. Everett E. Edwards. Tuesdays and Thursdays. Room 223-224, East Wing.

First semester.--A consideration of the main facts, forces, and conditions which have entered into the development of agriculture in the United States since the first settlement, together with indication of the extent to which the major problems of our national life have been agricultural. This will bring the changes, the trends, and the ways in which adjustments have been made into relief and helps explain the genesis of present agricultural life. The aim is to give this historical information to facilitate the work of and increase the interest of those engaged in solving rural problems.

THE LITERATURE OF RURAL LIFE (second semester). Credit course. Mr. Nelson Antrim Crawford. First meeting Wednesday, February 1. Room 102, No. 215 13th St. S.W. Reading, lectures, and discussions of the literature of rural life from early times to the present, with emphasis on contemporary writing in this field. Fiction, poetry, drama, and other expressions of the life of the country will be treated. The purpose will be both to develop an understanding of the farmer's mind and of the philosophy of rural life, and to build a sound basis for literary appeal to the farmer and for interpreting agriculture and rural life to city people.

PLANT AND ANIMAL GENETICS (year). Credit course. Mr. W. B. Kemp, first semester, Plant Genetics; Dr. Hugh C. McPhee, second semester, Animal Genetics. Monday and Wednesday. Room 223-224, East Wing.

First semester.--The history and the present practice of plant breeding with genetic principles that underlie this practice as applied to plants that are self-fertilized, open-fertilized, and propagated by asexual means. Also a detailed study of type cases to learn the extent of artificial improvement, means for measuring this improvement, and comparative results obtained by use of the different breeding methods.

Second semester.--A brief review of the physical basis of heredity; inheritance in farm animals; variations and mutations; sex determination; inbreeding and crossbreeding; selection. If time permits a discussion will be given of the animal breeding projects which are now being carried on at various places in this country.

OUTSIDE COURSE
George Washington University

PHYSICS OF THE AIR. Dr. W. J. Humphreys, Weather Bureau.

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MISS LACY

U. S. DEPARTMENT OF AGRICULTURE
OFFICE OF THE DIRECTOR OF SCIENTIFIC WORK
WASHINGTON, D. C.
January 20, 1928.

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GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE
1927-28

ANNOUNCEMENT OF SECOND-SEMESTER COURSES

The Graduate School of the Department of Agriculture plans to inaugurate three new courses the second semester of the current school year, provided they are justified by the demand. Prospective students should send their names promptly to my Office, and should without fail be present at the first meeting of the class in the course in which they are interested.

The new courses are--

(1) Soil genesis, classification, erosion, and flood control. Credit course. Dr. Curtis F. Marbut, soil genesis and soil classification, 20 periods; Mr. H. H. Bennett and Mr. S. H. McCrory, erosion and flood control, 10 periods. Mondays and Wednesdays, beginning Monday, January 30. Room 311, Building F, 7th Street.

(2) The literature of rural life. Credit course. Mr. Nelson Antrim Crawford. First meeting Wednesday, February 1, when the days of the week for the regular meetings of the class will be determined. Room 102, 215 13th St., S. W.

(3) Animal genetics. Credit course. Dr. Hugh C. McPhee. Mondays and Wednesdays, beginning Monday, February 13. Room 223-224, East Wing.

The courses now in progress which will be continued through the second semester are--

(1) Elementary statistical methods. Non-credit. Mr. C. M. Purvis. Mondays and Fridays, beginning Monday, February 13. Room 411, Bieber Building, B. St., near 14th, S. W.

(2) Advanced statistical methods. Credit course. Mr. H. R. Tolley and Mr. M. J. B. Ezekiel. Tuesdays and Thursdays, beginning Tuesday, February 21. Room 411 Bieber Building, B. St., near 14th, S. W.

(3) Review of mathematics. Non-credit course. Mr. E. W. Woolard. Tuesdays and Thursdays, beginning Thursday, February 16. Room 500 Crop Estimates, fifth floor, 200 14th St., S. W.

(4) Prices and price relationships. Credit course. Mr. M. J. B. Ezekiel. Mondays and Wednesdays, beginning Monday, February 20. Room 500 Crop Estimates, fifth floor, 200 14th St., S. W.

(5) Scientific French. Credit course. Dr. H. B. Humphrey. Mondays and Wednesdays, beginning Monday, February 13. Room 106, West Wing.

(6) Intermediate scientific German. Non-credit course. Dr. Charles Drechsler. Tuesdays and Thursdays, beginning Tuesday, February 14. Room 33, Basement East Wing.

(7) Russian. Dr. C. H. Leineweber. Tuesdays and Thursdays, beginning Thursday, February 9. Department Library Reading Room, Bieber Building, B St., near 14th, S. W.

A. F. Woods,
Director, Graduate School.

U. S. DEPARTMENT OF AGRICULTURE
OFFICE OF THE DIRECTOR OF SCIENTIFIC WORK
WASHINGTON, D. C.
January 20, 1928.

GRADUATE SCHOOL
U.S. DEPARTMENT OF AGRICULTURE
1927-28

ANNOUNCEMENT
OF SECOND-SEMESTER COURSES

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(3) Review of mathematics. Non-credit course. Mr. E. W. Woolard. Tuesdays and Thursdays, beginning Thursday, February 16. Room 500 Crop Estimates, fifth floor, 200 14th St., S. W.

(4) Prices and price relationships. Credit course. Mr. M. J. B. Ezekiel. Mondays and Wednesdays, beginning Monday, February 20. Room 500 Crop Estimates, fifth floor, 200 14th St., S. W.

(5) Scientific French. Credit course. Dr. H. B. Humphrey. Mondays and Wednesdays, beginning Monday, February 13. Room 106, West Wing.

(6) Intermediate scientific German. Non-credit course. Dr. Charles Drechsler. Tuesdays and Thursdays, beginning Tuesday, February 14. Room 33, Basement East Wing.

(7) Russian. Dr. C. H. Leineweber. Tuesdays and Thursdays, beginning Thursday, February 9. Department Library Reading Room, Bieber Building, B St., near 14th, S. W.

A. F. Woods,
Director, Graduate School.

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON
September 15
1928

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GRADUATE SCHOOL

PRELIMINARY ANNOUNCEMENT
1928-29

The Graduate School of the U. S. Department of Agriculture will begin its courses for the first semester of the 1928-29 school year during the week commencing October 15. Classes will meet in the Department buildings, as heretofore, and will start at 4:30 or as soon thereafter as the members can assemble. Tuition is $25 for the two semesters of 30 hours each, or $15 for the first and $10 for the second, payment for each to be made in advance.

To enable us to determine what courses are desired and which ones we will be justified in conducting those wishing to avail themselves of the opportunity for advancement afforded by the Graduate School are requested to check on the list on the last page the course or courses in which interested, add such other subjects as may be desired, fill in the name and address, and detach and return the sheet promptly as possible.

As soon as we can determine from the returns what courses will be conducted final announcement, with complete details regarding each course, will be sent out, and those interested may then register at my office.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited graduate schools. A limited number of such problems will probably be available this year.

A. F. Woods,
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

SOIL GENESIS, CLASSIFICATION, AND EROSION. (one semester) Credit course. Dr. Curtis F. Marbut, Soil Genesis and Soil Classification, 25 periods; Mr. H. H. Bennett, Erosion, 5 periods. Mondays, Wednesdays, and Fridays, beginning Monday, December 17, Room 311, Building F, 7th Street. The purpose of this course is to explain the new concept of soils and to set forth the problems of soil erosion and flood control. The genetic concept of soils; the basis and principles of soil classification; and the classification of the soils of the United States and of the world; soil erosion as a national problem; erosion and its relation to soil types, its effects on agriculture, and methods of occurrence, prevention, and control; flood control.

PLANT GENETICS. Credit course. Mr. W. B. Kemp (one semester.) Mondays and Wednesdays, Room 223-224 East Wing. The history and the present practice of plant breeding with genetic principles that underlie this practice as applied to plants that are self-fertilized, open-fertilized, and propagated by asexual means. Also a detailed study of type cases to learn the extent of artificial improvement, means for measuring this improvement, and comparative results obtained by use of the different breeding methods.

PLANT PHYSIOLOGY, (year). Credit course. Dr. Burton E. Livingston. First semester. An advanced course discussing the plant body with reference to retention of form, entrance movement and exit of material, material changes within the body growth under symmetrical and unsymmetrical conditions (bending). The environmental control of plant activity and the application to agricultural operations will be considered. Reference texts: Coulter, Barnes and Cowles' "Textbook of Botany", Vol. I, Part II. Physiology (sold separately); Palladin's "Plant Physiology".

Second semester.--A continuation of the first term course. Reference texts: Coulter, Barnes and Cowles' "Textbook of Botany", Vol. I, Part II, Physiology (sold separately); Palladin's "Plant Physiology".

INSTRUMENTATION.--Details regarding this course will be given in the Final Announcement.

UNDERGRADUATE COURSES

ELEMENTARY STATISTICAL METHODS (year). Non-credit course. Mr. C. F. Sarle, Monday and Friday, 411 Bieber Building.

First semester.--The methods, analysis and presentation of measures describing single series; tabular construction; graphic methods; the organization of statistical investigations; analysis of problem, sources of materials, units, schedules, the use and limitations of sample data; index number construction. Considerable time will be spent analyzing samples, showing principles underlying methods of editing sample data, testing for accuracy and the relation between size of sample and the probable error of the results.

Second semester.--Technique of analysis of time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion and study of the methods and results used in actual statistical investigations.

ADVANCED STATISTICAL METHODS (year). Credit course. Mr. H. R. Tolley and Mr. M. J. B. Ezekiel. Tuesday and Thursday, 411 Bieber Building:

First semester.--Theory of sampling and its application to the collection and analysis of statistical data.

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work; Yule's "Introduction to the Theory of Statistics." Prerequisites, elementary work in statistics and algebra through simultaneous equations.

PRICES AND PRICE RELATIONSHIPS (year). Credit course. Mr. M. J. B. Ezekiel first semester and Mr. Warren C. Waite second semester (days of meeting will be given in final announcement):

First semester.--Economic basis of price analysis: Examination of what prices are with regard to different methods of arriving at prices and different methods of recording prices; different points of view in price analysis, distinguishing between the effect of supply upon price, the effect of price upon

subsequent supply, and the effect of price upon consumption; the time factor in price analysis with regard to meaning of price trends, periodic variations in prices and seasonal variations in prices; the price level factor in price analysis, dynamic factors in price analysis; and uses of price analysis. Prospective students should have a knowledge of elementary statistics. Sufficient laboratory work will be given to provide concreteness to the principles discussed, but no effort will be made to teach details of technical statistics.

Second semester.--Economics of Consumption: This course will deal with social and economic conditions that affect consumption, including the effect of changes in income and in price upon consumption, elasticity of demand, changes in consuming habits of the people, and the effect of these changes upon the market for agricultural products.

REVIEW OF MATHEMATICS (year). Non-credit course. Mr. E. W. Woolard. Tuesday's and Thursdays, No. 500 Crop Estimates:

First semester.--Review of mathematics up to calculus, including algebra, trigonometry, and analytical geometry.

Second semester.--Differential and integral calculus.

PRINCIPLES AND PRACTICES IN AGRICULTURAL COOPERATION (first semester). Credit course. Mr. A. W. McKay. Wednesdays and Saturdays, 411 Bieber Building. This course will outline the nature, growth, and extent of cooperation in agriculture, the types of organizations it has developed, the problems it seeks to solve, and the policies and practices which have been adopted. Special attention will be given to the organization and operating methods of successful associations and to the possibilities and limitations of the movement.

HISTORY OF AMERICAN AGRICULTURE (year). Credit course. Mr. Everett E. Edwards. Tuesdays and Thursdays (place class will meet to be indicated in final announcement):

First semester.--A chronological consideration of the main events, factors, and conditions which have entered into the development of agriculture in the United States since the first permanent European settlement until about 1850. This will bring the changes, the trends, and the ways in which adjustments have been made into relief and help explain the genesis of present agricul-

tural conditions. It will indicate the extent to which the major problems of our national life have been agricultural. The historical information to be derived from the course should facilitate the work of and increase the interest of those engaged in solving agricultural problems.

Second semester.--Analysis of the factors in American agricultural development, together with their ramifications during the period from about 1850 to the present

POULTRY HUSBANDRY (one semester, 1929). Non-credit course. Dr. M. A. Jull (Details regarding course will be given in final announcement).

SCIENTIFIC FRENCH (year). Credit course. Dr. H. B. Humphrey. Monday and Wednesday, 106 West Wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie," Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Perquisite, a knowledge of the elements of French grammar and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year). Non-credit course. Dr. Charles Drechsler. Tuesday and Thursday, Room 33, Basement East Wing. Reading and translation of German scientific prose with some individual work in the preparation of a finished translation of an article in the particular field in which the student may be more directly interested (20 to 30 pages); review of German throughout. Perquisite, an elementary knowledge of German.

COMMERCIAL SPANISH (year). Credit course (no credit for beginners). Dr. C. H. Leineweber. Twice a week. Hours to be arranged. The purpose of this course is to familiarize the advanced student with the spoken and written language. The special arrangement of the course permits also beginners in Spanish to join.

ADVANCED RUSSIAN (year). Credit course (no credit for beginners). Dr. C. H. Leineweber. Twice a week. Hours to be arranged. The principal phases of Russian literature will be discussed. Reading and interpretation of selected works of representative authors. The Russian mind and its philosophy. A review of the essentials of grammar will be made in order to enable new students to follow the course profitably.

A complete file of the 1929 catalogues of local educational institutions is available for consultation in the Office of the Director of Scientific Work, and as soon as issued the list of courses to be offered by the Bureau of Standards will be added to this file.

Dr. A. F. Woods,
Director of Scientific Work and Graduate School.

Dear Doctor Woods:

I am interested in and will probably take the course or courses checked in the following list:

GRADUATE COURSES

(1) Soil genesis, classification, and erosion
(2) Plant genetics
(3) Plant physiology
(4) Instrumentation

UNDERGRADUATE COURSES

(5) Elementary statistical methods
(6) Advanced statistical methods
(7) Prices and price relationships
(8) Review of mathematics
(9) Principles and practices in agricultural cooperation
(10) Poultry husbandry
(11) History of American agriculture
(12) Scientific French
(13) Intermediate scientific German
(14) Commercial Spanish
(15) Russian.

I am interested in and would probably take a course in the following subject if offered.....

.....

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Name.....

Address.....

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MAR 2 1931

UNITED STATES DEPARTMENT OF AGRICULTURE
Director of Scientific Work
Washington

October 4
1928

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G R A D U A T E S C H O O L

F I N A L A N N O U N C E M E N T
1928-29

The Graduate School of the U. S. Department of Agriculture will begin its courses for the first semester of the 1928-29 school year during the week commencing October 15. Classes will meet in the Department building, as heretofore, and will start at 4:30 or as soon thereafter as the members can assemble. Tuition is $25 for the two semesters of 30 hours each, or $15 for the first and $10 for the second, payment for each to be made in advance.

To enable us to determine what courses are desired and which ones we will be justified in conducting, those wishing to avail themselves of the opportunity for advancement afforded by the Graduate School are requested, if this has not already been done, to check on the list on the last page the course or courses in which interested, add such other subjects as may be desired, fill in the name and address, and detach and return the sheet as promptly as possible.

In conncection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited graduate schools. A limited number of such problems will probably be available this year.

A. F. Woods,
Director of Scientific Work
and Graduate School.

G R A D U A T E C O U R S E S

SOIL GENESIS, CLASSIFICATION, AND EROSION (one semester). Credit course. Dr. Curtis F. Marbut, Soil Genesis and Soil Classification, 25 periods; Mr. H. H. Bennett, Erosion, 5 periods. Mondays, Wednesdays, and Fridays, beginning Monday, December 17, Room 311, Building F, 7th Street. The purpose of this course is to explain the new concept of soils and to set forth the problems of soil erosion and flood control. The genetic concept of soils; the basis and principles of soil classification; and the classification of the soils of the United States and of the world; soil erosion as a national problem; erosion and its relation to soil types, its effect on agriculture, and methods of occurrence, prevention, and control; flood control.

PLANT GENETICS (one semester). Credit course. Prof. W.B. Kemp, Monday and Wednesday, beginning October 15, Room 223-224 East Wing. The history and the present practice of plant breeding with genetic principles that underlie this practice as applied to plants that are self-fertilized, open-fertilized, and propagated by asexual means. Also a detailed study of type cases to learn the extent of artificial improvement, means for measuring this improvement, and comparative results obtained by use of the different breeding methods.

PLANT PHYSIOLOGY (year). Credit course. Dr. Burton E. Livingston. Saturday and another day of the week to be decided at first meeting, October 20. Room 223-224, East Wing.

First semester.--An advanced course discussing the plant body with reference to retention of form, entrance, movement and exit of material, material changes within the body, growth under symmetrical and unsymetrical conditions. The environmental control of plant activity and the application to agricultural operations will be considered. Reference texts: Coulter, Barnes and Cowles' "Textbook of Botany," Vol. I, Part II, Physiology (sold separately); Palladin's "Plant Physiology," third American edition, and Raber's "Principles of Plant Physiology." Students should also become acquainted with Pfeffer's "Plant Physiology," the most valuable general reference work.

Second semester.--A continuation of work of the first semester, with the same reference texts.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester). Credit course, beginning the last week of January. Instructors and dates and place of meeting and the additional lectures to complete the course will be indicated in the second-semester announcement, which will appear about the middle of January. - A composite course by a number of workers in the Department of Agriculture and Bureau of Standards - one to three lectures by each individual. The lectures

will deal with special new or little-known scientific instruments and special scientific apparatus and the special methods of using the same in investigational work or in agriculture. As far as arranged for these lectures will be as follows:

The Microscope and Its Accessories	A. N. Cobb	3 lectures
Testing and Rating Microscope Lenses	E. G. Artzberger	1 lecture
Bates Aspirator and Other Drain Testing Devices	E. G. Burner	1 or 2 "
Spectrophotometer	W. C. Holmes	1 or 2 "
Hydrogen Ion Concentration and Its Measurement	E. T. Wherry	1 or 2 "
The Hydrogen Electrode Method of Hydrogen Ion Measurement	Edw.F.Schneider	1 lecture
The Quinhydrone method of Hydrogen Ion Measurement.	L. E. Dawson	1 "
The Polarizing Microscope as an Aid to the Chemist	E. T. Wherry	1 or 2 lectures
Paper and Leather Testing Equipment	R. W. Frey	1 " "
Waterproofing Equipment for Testing Water Resistance	T. D. Jarrell	1 " "
Dupont Still for Fractionation of Turpentine	E. K. Nelson	1 " "
Micro-Determinations	E. P. Clark	1 " "
Saccharimeter, polariscope, ultramicroscope, cataphoresis apparatus, turbidiscope, nephelometer, recording potentiometer.	R. T. Balch and J. A. Ambler	" " 1 " "
High Pressure Equipment to 1000 Atmospheres	E. P. Bartlett	1 " "
Apparatus for the Study of Reaction Rates at High Pressures and Temperatures	P. H. Emmett	1 " "
Pyrometers and Their Uses in Fertilizer Investigations	A. R. Mertz	1 " "
The Potentiometer and Its Uses in Fertilizer Investigation and Laboratory Work	K. D. Jacob	1 " "
X-ray Apparatus and Methods as Applied to Researches in Agriculture	S. B. Hendricks	2 lectures
Apparatus for Use in the Study of Molecular States of Gases by Band Spectrum Analysis	O. R. Wulf	1 or 2 lectures
Apparatus and Technique for Producing a Vacuum and Low Pressures. Investigations on Gases and Surfaces at Low Pressures	C. H. Kunsman	2 lectures

ADVANCED STATISTICAL METHODS (year). Credit course. Mr. H. R. Tolley and Mr. M. J. B. Ezekiel. Tuesday and Thursday, beginning October 16, 411 Bieber Building:

First semester.--Theory of sampling and its application to the collection and analysis of statistical data.

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work; Yule's "Introduction to the Theory of Statistics." Prerequisites, elementary work in statistics and algebra through simultaneous equations.

PRICES AND PRICE RELATIONSHIPS (year). Credit course. Mr. M. J. B. Ezekiel first semester and Mr. Warren C. Waite second semester, Monday and Friday, beginning October 15. Room 305, Crop Estimates, 14th and B, S.W.

First semester.--Economic basis of price analysis: Examination of what prices are with regard to different methods of arriving at prices and different methods of recording prices; different points of view in price analysis, distinguishing between the effect of supply upon price, the effect of price upon subsequent supply, and the effect of price upon consumption; the time factor in price analysis with regard to meaning of price trends, periodic variations in prices and seasonal variations in prices; the price level factor in price analysis, dynamic factors in price analysis; and uses of price analysis. Prospective students should have a knowledge of elementary statistics. Sufficient laboratory work will be given to provide concreteness to the principles discussed, but no effort will be made to teach details of technical statistics.

Second semester.--Economics of Consumption: This course will deal with social and economic conditions that affect consumption, including the effect of changes in income and in price upon consumption; elasticity of demand, changes in consuming habits of the people, and the effect of these changes upon the market for agricultural products.

HISTORY OF AMERICAN AGRICULTURE (year). Credit course. Mr. Everett E. Edwards, Tuesdays and Thursdays, beginning October 16, 1363 C St., S. W., first floor, Projection Room.

First semester.--A chronological consideration of the main events, factors, and conditions which have entered into the development of agriculture in the United States since the first permanent European settlement until about 1850. This will bring the changes, the trends, and the ways in which adjustments have been made into relief and help explain the genesis of present agricultural conditions. It will indicate the extent to which the major problems of our national life have been agricultural. The historical information to be derived from the course should facilitate the work and increase the interest of those engaged in solving agricultural problems.

Second semester.--Analysis of the factors in American agricultural development, together with their ramifications during the period from about 1850 to the present.

U N D E R G R A D U A T E C O U R S E S

ELEMENTARY STATISTICAL METHODS (year). Non-credit course. Mr. C. F. Sarle, Monday and Friday, beginning October 15. 411 Bieber Building.

First semester.--The methods, analysis and presentation of measures describing single series; tabular construction; graphic methods; the organization of statistical investigations; analysis of problem, sources of materials, units, schedules, the use and limitations of sample data; index number construction. Considerable time will be spent analyzing samples, showing principles underlying methods of editing sample data, testing for accuracy and the relation between size of sample and the probable error of the results.

Second semester.--Technique of analysis of time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion and study of the methods and results used in actual statistical investigations.

REVIEW OF MATHEMATICS (year). Non-credit course. Mr. E. W. Woolard. Tuesdays and Thursdays, beginning October 16. No. 305 Crop Estimates, 14th and B, S.W.

First semester.--Review of mathematics up to calculus, including algebra, trigonometry, and analytical geometry.

Second semester.--Differential and integral calculus

PRINCIPLES AND PRACTICES IN AGRICULTURAL COOPERATION (first semester). Credit course. Mr. A. W. McKay. Wednesday and Saturday, beginning October 17. 411 Bieber Building. This course will outline the nature, growth, and extent of cooperation in agriculture, the types of organizations it has developed, the problems it seeks to solve, and the policies and practices which have been adopted. Special attention will be given to the organization and operating methods of successful associations and to the possibilities and limitations of the movement.

POULTRY HUSBANDRY (one semester). Non-credit course. Dr. M. A. Jull. Monday and Wednesday, beginning February 4. Room 225, Building F, 7th St. This course will be primarily practical rather than technical in nature, and will deal with the nature and uses of poultry products; poultry industry in the United States; breeds and varieties of poultry; breeding principles and practices; development of the egg; incubation and brooding principles and practices; rearing principles; housing principles and practice; yarding practice; poultry nutrition, including poultry feeds, and the feeding of chicks, laying stock, and market poultry; sanitation, parasites, and diseases; preparing eggs for market and marketing; and the egg industry.

SCIENTIFIC FRENCH (year). Credit course, Dr. H. B. Humphrey. Monday and Wednesday, beginning October 15. 106 West Wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie," Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Prerequisite, a knowledge of the elements of French grammar and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year). Non-credit course. Dr. Charles Drechsler. Tuesday and Thursday, beginning October 16. Room 33, Basement, East Wing. Reading and translation of German scientific prose with some individual work in the preparation of a finished translation of an article in the particular field in which the student may be more directly interested (20 to 30 pages); review of German throughout. Prerequisite, an elementary knowledge of German.

COMMERCIAL SPANISH (year). Credit course (no credit for beginners). Dr. C. H. Leineweber. Tuesday and Friday, beginning October 16. Room 223-224, East Wing. The purpose of this course is to familiarize the advanced student with the spoken and written language. The special arrangement of the course permits also beginners in Spanish to join.

ADVANCED RUSSIAN (year). Credit course (no credit for beginners). Dr. C. H. Leineweber. Thursday and Saturday, beginning October 18. Reference Room, Library of the Department, first floor, Bieber Building. The principal phases of Russian literature will be discussed. Reading and interpretation of selected works of representative authors. The Russian mind and its philosophy. A review of the essentials of grammar will be made in order to enable new students to follow the course profitably.

A complete file of the 1929 catalogues of local educational institutions and list of courses to be offered by the Bureau of Standards are available for consultation in the Office of the Director of Scientific Work.

Dr. A. F. Woods,
Director of Scientific Work and Graduate School.

Dear Doctor Woods:

I am interested in and will probably take the course or courses checked in the following list:

GRADUATE COURSES

(1) Soil genesis, classification and erosion
(2) Plant genetics ✓
(3) Plant physiology ✓
(4) Scientific Instruments and their Use.
(5) Advanced statistical methods ✓
(6) Prices and price relationships ✓
(7) History of American agriculture ✓

UNDERGRADUATE COURSES

(8) Elementary Statistical methods ✓
(9) Review of mathematics ✓
(10) Principles and practices in agricultural cooperation ✓
(11) Poultry husbandry ✓
(12) Scientific French ✓
(13) Intermediate scientific German ✓
(14) Commercial Spanish ✓
(15) Russian. ✓

I am interested in and would probably take a course in the following subject if given_____

_____

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Name_____

Address_____

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MAR 2 1931

January 19
1929

GRADUATE SCHOOL
AGRICULTURAL ECONOMICS
U. S. DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

SECOND SEMESTER ANNOUNCEMENT

The second semester of the eight Graduate School courses now under way will begin on the dates hereinafter indicated. In addition to these eight two new courses will be offered--Poultry Husbandry and Scientific Instruments and their Use.

Besides the valuable information the latter course will make available it will afford an excellent opportunity to become acquainted with the work that is being carried on in various branches of the Department and to some extent also in the Bureau of Standards.

Because of the various circumstances that must be taken into consideration as the course proceeds and the non-portable nature of some of the apparatus to be demonstrated the order in which the lectures will be given and the rooms in which the class will meet can not be given in this announcement. At each meeting, however, the room in which the subsequent meeting will be held, the name of the lecturer, and the subject of the lecture will be announced, and this information will also be posted on the door of Room 110 West Wing, headquarters of the class.

Each prospective student of either of the new courses is requested to check on the application blank on the last page the one he plans to take, sign his name, and return the application to me promptly.

All classes will meet at 4:30 or as soon thereafter as the members can assemble. The tuition will be, as usual, $25 for two semesters and $15 for one.

A. F. Woods,
Director of Scientific Work.

GRADUATE COURSES

PLANT PHYSIOLOGY (year). Credit course. Dr. Burton E. Livingston. Saturday and Thursday, beginning, February 16. Room 223-224, East Wing.

Second semester.--A continuation of work of the first semester. An advanced course discussing the plant body with reference to retention of form; entrance, movement and exit of material; material changes within the body; growth under symmetrical and unsymmetrical conditions. The environmental control of plant activity and the application of agricultural operations will be considered. Reference texts: Coulter, Barnes and Cowles' "Textbook of Botany," Vol. I, Part II, Physiology (sold separately); Palladin's "Plant Physiology," third American edition, and Raber's "Principles of Plant Physiology." Students should also become acquainted with Pfeffer's "Plant Physiology," the most valuable general reference work.

ADVANCED STATISTICAL METHODS (year). Credit course. Mr. H. R. Tolley and Mr. M. J. B. Ezekiel. Tuesday and Thursday, beginning February 12, 411 Bieber Building:

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work. Prerequisites, elementary work in statistics and algebra through simultaneous equations.

PRICES AND PRICE RELATIONSHIPS (year). Credit course. Mr. M. J. B. Ezekiel first semester and Mr. Warren C. Waite second semester, Monday and Friday, beginning February 11 (If the members so desire this class may meet at 7:45 a.m.), Room 305, Crop Estimates, 14th and B, S.W.

Second semester.-- Economics of Consumption: This course will deal with social and economic conditions that affect consumption, including the effect of changes in income and in price upon consumption, elasticity of demand, changes in consuming habits of the people, and the effect of these changes upon the market for agricultural products.

HISTORY OF AMERICAN AGRICULTURE (year). Credit course. Mr. Everett E. Edwards, Tuesday and Thursday beginning February 21, Room 311, Bieber Bldg., 1358 B St., S. W.

Second semester.--Analysis of the factors in American agricultural development, together with their ramifications during the period from about 1850 to the present.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester). Credit course. Tuesday and Thursday, beginning January 29. Room 110, West Wing. A composite course by workers in the Department of Agriculture and the Bureau of Standards, one or two lectures by each instructor. The lectures will deal with special new or little-known scientific instruments and special scientific apparatus and methods of using same in research work and in agriculture. Because of the composite nature of the course and the number of lecturers minor changes may be made or new speakers in-

troduced as it proceeds. Room 110 West Wing, headquarters of the class, will be used when practicable. Changes necessary will be announced one or two meetings in advance and will be posted in the headquarters room, as heretofore stated. The list of lectures and lecturers is as follows:

Special and little-known ways in which the microscope can be of use to the Biologist.	A. N. Cobb	1 lecture
Testing and rating microscope lenses.	E. G. Artzberger	1 lecture
The Polarizing Microscope as an aid to the Chemist	E. T. Wherry	1 or 2 lectures
Micro-determinations.	E. P. Clark	1 or 2 lectures
Saccharimeter, polariscope, ultramicroscope, cataphoresis apparatus, turbidiscope, nephelometer, recording potentiometer.	R. T. Balch and J. A. Ambler	1 or 2 lectures
Spectrophotometer.	W. C. Holmes	1 or 2 lectures
Hydrogen ion concentration and its measurement.	E. T. Wherry	1 or 2 lectures
The hydrogen electrode method of hydrogen ion measurement.	Edw. F. Schneider	1 lecture
The quinhydrone method of hydrogen ion measurement.	L. E. Dawson	1 lecture
Leather testing equipment	R. W. Frey	1 or 2 lectures.
Waterproofing equipment for testing water resistance.	T. D. Jarrell	1 or 2 lectures
Dupont still for fractionation of Turpentine.	E. K. Nelson	1 or 2 lectures
High pressure equipment to 1000 atmospheres.	E. P. Bartlett	1 or 2 lectures
Apparatus for the study of reaction rates at high pressures and temperatures.	P. H. Emmett	1 or 2 lectures
Pyrometers and their uses in fertilizer investigations.	A. R. Mertz	1 or 2 lectures
The potentiometer and its uses in fertilizer investigation and laboratory work.	K. D. Jacob	1 or 2 lectures

X-ray apparatus and methods as applied to researches in agriculture - S. B. Hendricks - - - 2 lectures

Apparatus for use in the study of molecular states of gases by band spectrum analysis. - - - - - - - - - - - O. R. Wulf - - - - - 1 or 2 lectures

Apparatus and technique for producing a vacuum and low pressures. Investigations on gases and surfaces at low pressures. - - - - - - - - - - - C. H. Kunsman- - - - 2 lectures

Bates aspirator and other grain testing devices.- - - - - - - - - - - E. G. Boerner- - - - 1 or 2 lectures

Methods and apparatus for gas analysis. - - - - - - - - - - - - - - - E. R. Weaver. - - - 1 lecture at B. S.

Methods of low temperature distillation. - - - - - - - - - - - - - E. W. Washburn.- - - 1 lecture

The Conduct and interpretation of combustion analyses. - - - - - - - - - - E. W. Washburn - - - 1 lecture

The measurement electrolytic conductivity. - - - - - - - - - - - - - Dr. Parker (of the - 1 lecture Leeds Northrup Co.)

U N D E R G R A D U A T E C O U R S E S

ELEMENTARY STATISTICAL METHODS (year). Non-credit course. C. F. Sarle and S. R. Newell, Monday and Friday, beginning February 11. 411 Bieber Building.

Second semester.--Technique of analysis of time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion and study of the methods and results used in actual statistical investigations.

POULTRY HUSBANDRY (one semester). Non-credit course. Dr. M. A. Jull. Monday and Wednesday, beginning February 4. Room 225, Building F, 7th St. This course will be primarily practical rather than technical in nature, and will deal with the nature and uses of poultry products; poultry industry in the United States; breeds and varieties of poultry; breeding principles and practices; development of the egg; incubation and brooding principles and practices; rearing principles; housing principles and practice; yarding practice; poultry nutrition, including poultry feeds, and the feeding of chicks, laying stock, and market poultry; sanitation, parasites, and diseases; preparing eggs for market and marketing; and the egg industry.

SCIENTIFIC FRENCH (year). Credit course. Dr. H. B. Humphrey. Monday and Wednesday, beginning Monday, February 18. Room 106 West Wing.

Second semester.--Translation of miscellaneous scientific texts from French to English. Approximately two-thirds of the semester will be devoted to the abstracting of French papers and reports on scientific research in biology, plant pathology, entomology, geology, meteorology, economics, etc.

INTERMEDIATE SCIENTIFIC GERMAN (year). Non-credit course. Dr. Charles Drechsler. Tuesday and Thursday, beginning February 12, Room 33, Basement, East Wing. Reading and translation of German scientific prose and review of grammar throughout. Prerequisite, an elementary knowledge of German.

ADVANCED RUSSIAN (year). Credit course (no credit for beginners), Dr. C. H. Leineweber. Thursday and Saturday, beginning February 14. Reference Room, Library of the Department, first floor, Bieber Building. The principal phases of Russian literature will be discussed. Reading and interpretation of selected works of representative authors. The Russian mind and its philosophy. A review of the essentials of grammar will be made in order to enable new students to follow the course profitably.

A complete file of the 1929 catalogues of local educational institutions and list of courses offered by the Bureau of Standards are available for consultation in the Office of the Director of Scientific Work.

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Dr. A. F. Woods,
Director of Scientific Work
and Graduate School.

Dear Doctor Woods:

I am interested in and expect to take the course checked below:

(1) Poultry Husbandry.

(2) Scientific Instruments and Their Use.

(Name) .....

(Address).....

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UNITED STATES DEPARTMENT OF AGRICULTURE
Director of Scientific Work
Washington

October 3,
1929

LIBRARY
AGRICULTURAL ECONOMICS

GRADUATE SCHOOL

FINAL ANNOUNCEMENT
1929-30

The Graduate School of the United States Department of Agriculture will open with the week beginning October 21. Classes will meet in the Department buildings and will start at 4:40 or as soon thereafter as the students can assemble. Tuition, which is payable in advance, is $25 for two semesters of 30 hours each, or $15 for the first and $10 for the second.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited graduate schools. A limited number of such opportunities will probably be available this year.

The faculty of the school is composed of a group of strong men who stand in the front rank in their respective fields. All are officials of the Department with the exception of Dr. James Johnson, who is Professor of Horticulture in the University of Wisconsin; and three members of the faculty of the University of Maryland, Dr. C. O. Appleman, Professor of Plant Physiology and Biochemistry and Dean of the Graduate School; Dr. W.B. Kemp, Professor of Genetics and Assistant Dean of the College of Agriculture; and Dr. M. M. Haring, Associate Professor of Chemistry, who was Assistant instructor in chemistry in Princeton 1916-17, and was Assistant Chemist in the Ordinance Department of the United States Army from 1914 to 1919, and is cooperating expert in the International Critical Tables.

We are planning a series of special lectures by leaders in fields of economic research. These lectures will be open to all students of the Graduate Schools, both present and past. Others desiring to attend will be charged 50 cents for each lecture. Admission will be by ticket, which can be obtained in my office from the Secretary of the School. The lectures will be announced in detail later.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employes may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

As shown by the returns from the recent questionnaire, a number of our students have filed certificates, which we issue on request, with the Universities of Maryland, Minnesota, Ohio, Wisconsin, Louisiana, Washington, Cornell University, George Washington University, American University, Johns Hopkins University, Yale University, University of Chicago, and Harvard University, and received credit toward the Ph.D., M.A., M.S., B.A., and B.S. degrees.

A file of the catalogues of the universities of the country is available for consultation in my office.

Each Chief of Bureau will be furnished a list of the members of his force registered in the School, together with title of course or courses taken and grade received.

Each of the following courses will be given if a sufficient number of students register.

A. F. Woods,
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

COMPOSITION AND UTILIZATION OF THE SOIL (year).--Mr. Horace G. Byers, first semester; Dr. Oswald Schreiner, second semester. Wednesday and Saturday, beginning October 23. Room 248 East Wing.

First semester.--The lectures will deal with the composition of the soils as revealed by the methods of physical and chemical examination and with the methods themselves. They will attempt to present in succint form that body of information about the soil which will be useful to workers in agronomy, forestry, horticulture, soil survey, soil fertility, and similar research. The various views of soil origin and colloidal composition and behavior will be presented, together with such conclusions as seem valid. The methods of diagnosis of soils and their indications will also be discussed.

Second semester.--A continuation of the work of the first term. The lectures will deal with an historical survey of early soil science and theories relating to soil fertility. The methods of maintaining soil fertility, the functions of organic and inorganic matter, the roles played by the common and rare elements in plant growth, and the use of fertilizers will be presented. The methods of making pot, field, and special tests and the questions involved in soil reaction will be discussed.

THE FUNDAMENTALS OF CHEMISTRY (year).--Dr. Horace Byers. Tuesday and Thursday, beginning October 22. Room 248 East Wing. This course is open to those who have had the usual combinations of courses in chemistry given in the undergraduate schools. The course deals with the general principles of chemistry, not alone as they exist today, but with the various phases through which they have passed. It has as its object to show the extent and the limitations of our knowledge of the fundamental facts, laws, and theories of the science and also how they came to be. It attempts to coordinate the basic ideas of the various branches of chemistry and is therefore a combination of theoretical and historical chemistry. It will be conducted as a seminar, though a few formal lectures will be given. A fair amount of library research and the presentation of the results will be required of each student.

COLLOID CHEMISTRY (one semester).--Dr. M. M. Haring. Monday and Friday, beginning October 21. Room 248 East Wing. The history, development, and present theories of colloidal chemistry; surface tension and free surface energy; colloidally dispersed systems; colloidal solutions, sols and gels, and the application of the principles of colloidal chemistry to biological and industrial problems will be considered. Prerequisite, a knowledge of the fundamentals of physical chemistry.

CONTROL OF PLANT DISEASES (one semester).--Monday, Wednesday, and Friday, beginning December 2, Room 110, West Wing. The present status of successful control of all types of plant diseases arranged on a crop basis. Without minimizing the importance of the use of fungicides, particular attention will be paid to the newer and unusual methods of plant disease prevention and control. Much of the information given will not be found in books or in bulletins or journals, but books and other publications will be freely cited for reference or reading during the course.

Introduction and general methods	Dr. M. B. Waite
Deciduous orchard fruits	Dr. M. B. Waite and Dr. John W. Roberts
Cranberries, grapes, and small fruits	Dr. C. L. Shear
Citrus and subtropical fruits	Prof. Harry B. Fulton
Fruits in transportation, storage, and on the market	Dr. Charles Brooks
Vegetables	Mr. W. W. Gilbert
Ornamental and greenhouse plants	Dr. Freeman Weiss
Forest and ornamental trees and shrubs	Dr. Haven Metcalf
Cereals	Dr. H. B. Humphrey
Sugar plants	Dr. E. W. Brandes
Cotton	Mr. W. W. Gilbert
Tobacco	Dr. James Johnson, University of Wisconsin

PLANT GENETICS (one semester).--Prof. W. B. Kemp, Monday and Wednesday, beginning October 21, Room 223-224, East Wing. The history and the present practice of plant breeding with genetic principles that underlie this practice as applied to plants that are self-fertilized, open-fertilized, and propagated by asexual means. Also a detailed study of type cases to learn the extent of artificial improvement, means for measuring this improvement, and comparative results obtained by use of the different breeding methods.

PHYSIOLOGY OF PLANT GROWTH AND DEVELOPMENT (one semester).--Dr. C. C. Appleman. Monday and Thursday, beginning January 28, Room 223-224, East Wing. Conceptions of growth; phases of growth; embryonic tissue or meristems; grand period of growth, growth cycles and growth curves, analysis and interpretations of growth curves; formal and formative conditions for growth and development; correlations in development; periodicity in vegetative life; polarity and regeneration; relation of metabolism to growth and development; growth-promoting accessory substances; physiological factors regulating normal and pathological growth; senescence and death.

ADVANCED STATISTICAL METHODS(year)--.Mr. H. R. Tolley and Mr. M.J.B. Ezekiel. Tuesday and Thursday, beginning October 22. 411 Bieber Building.

First semester.--Theory of sampling and its application to the collection and analysis of statistical data.

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work; Yule's "Introduction to the Theory of Statistics." Prerequisites, elementary work in statistics and algebra through simultaneous equations.

HISTORY OF AMERICAN AGRICULTURE (year).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning October 22. Room 311, Bieber Building, 1358 B. St., S. W.

First semester.--Introduction; European background of agriculture in the United States; geographic factors; the Indians, their agriculture, contributions to American agriculture, and influence on agrarian migration in the United States; agrarian settlement of the English colonies in America to the time of their revolt; land systems and land tenure in the English colonies; agriculture in the English colonies in America; trade and markets of agricultural products of the English colonies in America; policies concerning the public domain, 1789-1862--their relation to agricultural development in America; agrarian colonization and settlement in America from the American Revolution to the American Civil War; agriculture from the American Revolution to the American Civil War; development of transportation facilities and home and foreign markets; farmers and political activity from the American Revolution to the American Civil War; agriculture, its relation to the sectional struggle.

Second semester.--The agricultural revolution, its elements and a consideration of its significance; laws and policies for disposal of the public domain, 1862 to the present agrarian settlement of the trans-Mississippi--West; farm implements and machinery; transportation; domestic and foreign markets; agencies promoting improved methods in agriculture; study of the history of agriculture since c. 1850-1860 by agricultural regions; farmers and political activity from 1860 to 1914; American agriculture during the World War; the cooperative movement; rural population changes and farm tendency; farmers and political activity during and since the World War; the agricultural problem, analyses and proposed solutions; Federal, regional, and State projects designed to aid agriculture; agriculture, its place in the life of the nation.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (one semester).--L. H. Bean. Wednesday and Saturday, beginning January 29, 1930. Room 305, Crop Estimates, 14th and B St., S. W. The course will cover the place of agriculture in the various theories of business cycles; the influences of agricultural production and prices on industrial activity, of farm income on the market for industrial products, and of prices on speculation and foreign trade; the influences of industrial and financial conditions, employment, and the buying power of city consumers on agricultural prices, farm expenditures, and net income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture.

PRICES AND PRICE RELATIONSHIPS (year).--Mr. M. J. B. Ezekiel, first semester, and Mr. Warren C. Waite, second semester, Monday and Friday, beginning October 21, Room 305, Crop Estimates, 14th and B, S.W.

First semester.--Economic basis of price analysis: Examination of what prices are with regard to different methods of arriving at prices and different methods of recording prices; different points of view in price analysis, distinguishing between the effect of supply upon price, the effect of price upon subsequent supply, and the effect of price upon consumption; the time factor in price analysis with regard to meaning of price trends, periodic variations in prices and seasonal variations in prices; the price level factor in price analysis, dynamic factors in price analysis; and uses of price analysis. Prospective students should have a knowledge of elementary statistics. Sufficient laboratory work will be given to provide concreteness to the principles discussed, but no effort will be made to teach details of technical statistics.

Second semester.--Economics of Consumption: This course will deal with social and economic conditions that affect consumption, including the effect of changes in income and in price upon consumption, elasticity of demand, changes in consuming habits of the people, and the effect of these changes upon the market for agricultural products.

PRINCIPLES OF TAXATION (year).--Mr. Eric Englund. Monday and Thursday, beginning October 21, Room 213, No. 300 Linworth Place, S. W. Principles of taxation as developed in the writings of noted economists will be studied from a theoretical standpoint and in their practical relation to the fiscal problems that stimulated their development, and especially to current problems in Federal and State taxation in the United States. Public expenditures and public debt will be studied in their relation to principles and practice in taxation. Special attention will be given to the prevailing system of taxation in relation to American Agriculture. Selected reading and class discussion.

ECONOMIC ASPECTS ON WEATHER AND AGRICULTURE (one semester).--Mr. J. B. Kincer. Thursday and Saturday, beginning October 24. Room 223-224 East Wing. Introductory meteorology; the physical aspects of weather and association of its various phases; weather and climate; climate and crops; world climate and its relation to the geographic distribution of crops; the climatic requirements of different crops and potential production areas; weather and crops; the relation of weather to crop growth and farming operations; the weather hazard to crops and possible means of minimizing or preventing crop loss.

U N D E R G R A D U A T E C O U R S E S

ELEMENTARY STATISTICAL METHODS (year).--Mr. C. M. Purves, Monday and Friday, beginning October 21. Room 411, Bieber Building.

First semester.--The methods, analysis and presentation of measures describing single series; tabular construction; graphic methods; the organization of statistical investigations; analysis of problem, sources of materials, units, schedules, the use and limitation of sample data; index number construction. Considerable time will be spent analyzing samples, showing principles underlying methods of editing sample data, testing for accuracy and the relation between size of sample and the probable error of the results.

Second semester.--Technique of analysis of time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

PRINCIPLES OF SYSTEMATIC BOTANY (one semester).--Dr. S. F. Blake, Tuesday and Thursday, beginning October 22. Room 110 West Wing. The course will cover the principles of systematic botany as applied to the classification of flowering plants, and will include practice in the use of botanical keys in the identification of fresh specimens. The following subjects will be treated: Meaning of the terms used in botanical descriptions; principles of botanical nomenclature; characters by which the principal families of flowering plants can be recognized; mention of the principal economic plants; method of study of local floras; preparation of herbarium specimens. No previous knowledge of botany is required. If the demand should justify a more advanced course it may be given next year for which this course will serve as an introduction.

AGRICULTURAL WRITING (one semester).--Mr. M. S. Eisenhower and staff of Office of Information and special lecturers. Tuesdays and Thursdays, beginning October 22, Room 102, Office of Information Building, 215 13th St., S. W. Lectures, discussions, and practice in preparing agricultural and other scientific material for publication in bulletins and in the various branches of the press, or for delivery as public and radio addresses. Special emphasis will be placed upon the educational aspects of publications, news and feature articles in the press, radio programs, and written addresses. Attention will be given to the demands of various types of readers with respect to both subject matter and style.

SPANISH (year).--Dr. C. H. Leineweber. Tuesday and Friday, beginning October 22. Room 223-224, East Wing. The purpose of this course is to familiarize the advanced student with the spoken and written language. The special arrangement of the course permits also beginners in Spanish to join.

SCIENTIFIC FRENCH (year).--Credit course. Dr. H. B. Humphrey. Monday and Wednesday, 106 West Wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie," Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Prerequisite, a knowledge of the elements of French grammar and elementary reading.

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MAR 2 1931

UNITED STATES DEPARTMENT OF AGRICULTURE

DIRECTOR OF SCIENTIFIC WORK

WASHINGTON

November 22
1929

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U.S. DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

ANNOUNCEMENT OF COURSE IN THE CONTROL OF PLANT DISEASES

Beginning Monday, December 2, the course described below will be given by the Graduate School of the United States Department of Agriculture. The class will meet in Room 206, No. 220 14th Street, S. W., at 4:40 on Monday, Wednesday, and Friday until January 27, beginning with which date Monday will be ommitted and other later dates substituted, as may be arranged in the class. This is to enable students to take the course in Plant Physiology also if any so desire. The tuition for this course will be, as usual, $15.

CONTROL OF PLANT DISEASES (one semester).--The present status of successful control of types of plant diseases arranged on a crop basis. Without minimizing the importance of the use of fungicides particular attention will be paid to the newer and unusual methods of plant-disease prevention and control. Much of the information given will not be found in books or in bulletins or journals, but books and other publications will be freely cited for reference or reading during the course.

Introduction and general methods	Dr. M. B. Waite
Deciduous orchard fruits	Dr. M. B. Waite Dr. John W. Roberts
Cranberries, grapes, and small fruits	Dr. C. L. Shear
Citrus and subtropical fruits	Prof. Harry B. Fulton
Fruits in transportation and storage and on the market	Dr. Charles Brooks
Vegetables	Mr. W. W. Gilbert
Ornamental and greenhouse plants	Dr. Freeman Weiss
Forest and ornamental trees and shrubs	Dr. Haven Metcalf
Pecans and other cultivated nuts	Dr. M. B. Waite
Cereals	Dr. H. B. Humphery
Forage Crops	Dr. John Monteith, Jr.
Sugar plants	Dr. E. W. Brandes
Cotton	Mr. W. W. Gilbert
Tobacco	Dr. James Johnson (Univ.Wis.)
Fungicides	Dr. John W. Roberts
Spraying and other equipment	Dr. M. B. Waite

A. F. Woods
Director of Scientific Work
and Graduate School.

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MAR 2 1931

UNITED STATES DEPARTMENT OF AGRICULTURE
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U.S. DEPARTMENT OF AGRICULTURE

January 20
1930

GRADUATE SCHOOL

SECOND SEMESTER
1929-30

The second semester of the Graduate School courses now under way will begin on the dates hereinafter indicated. In addition to the 9 courses which will be continued through the second semester three new ones will be offered, that is Physiology of Plant Growth and Development, Business Cycles in Relation to Agriculture, and Russian for Beginners.

The classes will meet at 4:40, as heretofore. Tuition is $25 where two semesters are taken or $15 for one semester, payable in advance.

The School has arranged to give a course of six lectures. These are open to all students of the Graduate School, past and present, and others interested, without cost. The lectures will be delivered at 3 p. m., the first in Room 411, Bieber Building, and all others in the Auditorium of the United States National Museum. The lectures are:

(1) February 1---Scientific Method in Economic Research, by E. B. Wilson, President, Social Science Research Council.

(2) February 8---Evaluating Institutions as a Factor in Economic Change, by J. R. Commons, University of Wisconsin.

(3) February 15-Fact and Interpretation in Economics, by F.H.Knight, University of Chicago.

(4) February 21-Experience in Stabilizing Price Levels, by E. A. Goldenweiser, Federal Reserve Board.

(5) March 1---Methods of Analysis in Agricultural Economic research, by J. D. Black, Harvard University.

(6) March 15--Efforts and Achievements in Directing Economic Activities in Agriculture, by E. G. Nourse, Institute of Economics.

A. F. Woods
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

COMPOSITION AND UTILIZATION OF THE SOIL (year).--Dr. Oswald Schreiner, Wednesday and Saturday, beginning February 12. Room 248 East Wing.

Second semester.--A continuation of the work of the first term. The lectures will deal with an historical survey of early soil science and theories relating to soil fertility. The methods of maintaining soil fertility, the functions of organic and inorganic matter, the roles played by the common and rare elements in plant growth, and the use of fertilizers will be presented. The methods of making pot, field, and special tests and the questions involved in soil reaction will be discussed.

THE FUNDAMENTALS OF CHEMISTRY (year).--Dr. Horace G. Byers, Tuesday and Thursday, beginning February 6. Room 248 East Wing.

Second Semester.--This course is open to those who have had the usual combinations of courses in chemistry given in the undergraduate schools. The course deals with the general principles of chemistry, not alone as they exist today, but with the various phases through which they have passed. It has as its object to show the extent and the limitations of our knowledge of the fundamental facts, laws, and theories of the science and also how they came to be. It attempts to coordinate the basic ideas of the various branches of chemistry and is therefore a combination of theoretical and historical chemistry. It will be conducted as a seminar, though a few formal lectures will be given. A fair amount of library research and the presentation of the results will be required of each student.

COLLOID CHEMISTRY (year).--Dr. M. M. Haring. Tuesday and Thursday, beginning February 4. Room 248 East Wing.

Second semester.--The history, development, and present theories of colloidal chemistry; surface tension and free surface energy; colloidally dispersed systems; colloidal solutions, sols and gels, and the application of the principles of colloidal chemistry to biological and industrial problems will be considered. Special topics and some of the practical applications of colloid chemistry will be discussed. Prerequisite, a knowledge of the fundamentals of physical chemistry.

PHYSIOLOGY OF PLANT GROWTH AND DEVELOPMENT (one semester).--Dr. C. C. Appleman. Monday and Thursday, beginning January 27, Room 223-224, East Wing. Conceptions of growth; phases of growth; embryonic tissue or meristems; grand period of growth, growth cycles, and growth curves; analysis and interpretations of growth curves; formal and formative conditions for growth and development; correlations in development; periodicity in vegetative life; polarity and regeneration; relation of metabolism to growth and development; growth-promoting accessory substances; physiological factors regulating normal and pathological growth; senescence and death.

ADVANCED STATISTICAL METHODS (year)--.Mr. H. R. Tolley and Mr. M.J.B. Ezekiel. Tuesday and Thursday, beginning February 18. 411 Bieber Building.

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work; Yule's "Introduction to the Theory of Statistics." Prerequisites, elementary work in statistics and algebra through simultaneous equations.

HISTORY OF AMERICAN AGRICULTURE (year).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning February 4. Room 311, Bieber Building, 1358 B St., S. W.

Second semester.--The agricultural revolution, its elements and a consideration of its significance; laws and policies for disposal of the public domain, 1862 to the present; agrarian settlement of the trans-Mississippi--West; farm implements and machinery; transportation; domestic and foreign markets; agencies promoting improved methods in agriculture; study of the history of agriculture since c. 1850-1860 by agricultural regions; farmers and political activity from 1860 to 1914; American agriculture during the World War; the cooperative movement; rural population changes and farm tendency; farmers and political activity during and since the World War; the agricultural problem, analyses and proposed solutions; Federal, regional, and State projects designed to aid agriculture; agriculture, its place in the life of the nation.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (one semester).--L. H. Bean. Wednesday and Saturday, beginning January 29, 1930. Room 505, Crop Estimates, 14th and B St., S. W. The course will cover the place of agriculture in the various theories of business cycles; the influences of agricultural production and prices on industrial activity, of farm income on the market for industrial products, and of prices on speculation and foreign trade; the influences of industrial and financial conditions, employment, and the buying power of city consumers on agricultural prices, farm expenditures, and net income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture.

PRICES AND PRICE RELATIONSHIPS (year).--Mr. M. J. B. Ezekiel, and Mr. Warren C. Waite, Monday and Friday, beginning February 17, Room 505, Crop Estimates, 14th and B, S. W.

Second semester.--Economics of Consumption: This course will deal with social and economic conditions that affect consumption, including the effect of changes in income and in price upon consumption, elasticity of demand, changes in consuming habits of the people, and the effect of these changes upon the market for agricultural products.

U N D E R G R A D U A T E C O U R S E S

ELEMENTARY STATISTICAL METHODS (year).--Mr. C. M. Purves, Monday and Friday, beginning February 13. Room 411, Bieber Building.

Second semester.--Technique of analysis of time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

PRINCIPLES OF SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Tuesday and Thursday, beginning February 15. Room 110, West Wing. The second semester will be devoted principally to the study of the local flora by means of fresh specimens of native flowering plants. The following subjects, begun in the first semester, will be continued: Meaning of botanical terms; principles of botanical nomenclature; characters of principal families of flowering plants; principal economic plants; preparation of herbarium specimens. If the demand should justify a more advanced course it may be given next year and if so this course will serve as introduction.

SPANISH (year).--Dr. C. H. Leineweber. Tuesday and Friday, beginning February 14. Room 223-224, East Wing.

Second semester.--The purpose of this course is to familiarize the advanced student with the spoken and written language. The special arrangement of the course permits also beginners in Spanish to join.

RUSSIAN (one semester).--Dr. C. H. Leineweber, Thursday and Saturday, beginning February 6. Room 505, Crop Estimates, 14th and B Streets, S. W. This is a course for beginners.

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UNITED STATES DEPARTMENT OF AGRICULTURE
Director of Scientific Work
Washington

August 25
1930

GRADUATE SCHOOL

PRELIMINARY ANNOUNCEMENT
1930-31

The Graduate School of the United States Department of Agriculture will open with the week beginning October 20. Classes will meet in the Department buildings and will start at 4:40 or as soon thereafter as the students can assemble. Tuition, which is payable in advance, is $25 for two semesters of 30 hours each, or $15 for the first and $10 for the second.

To enable us to determine what courses are desired and which ones we will be justified in offering each person interested in the opportunity for advancement afforded by the Graduate School is requested to check on the list on the last page the course or courses he or she expects to take, add such other subjects as may be desired, fill in the name and address, and detach and return the sheet promptly.

Final announcement, with complete details regarding each course to be offered, will be issued as soon as we can determine from the returns the courses desired.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited graduate schools. A limited number of such opportunities will probably be available this year.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the

Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employes may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

As shown by the returns from the recent questionnaire, a number of our students have filed the certificates we issue on request with the Universities of Maryland, Minnesota, Ohio, Wisconsin, Louisiana, Washington, Cornell University, George Washington University, American University, Johns Hopkins University, Yale University, University of Chicago, and Harvard University, and received credit toward the Ph.D., M.A., M.S., B.A., and B.S. degrees.

A file of the catalogues of the universities of the country is available for consultation in my office.

Each Chief of Bureau is furnished annually a list of the members of his force registered in the School, together with title of course or courses taken and grade received.

Besides the courses outlined in the following pages others will be added, for instance, scientific language courses, if the returns show sufficient demand. It is suggested that any one interested in such courses consult with other prospective students and ask them to indicate their desire.

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Fill out the final sheet, detach, and return to me promptly.

A. F. Woods
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

ADVANCED INORGANIC CHEMISTRY (year).-- Dr. Horace G. Byers. Wednesday and Saturday, beginning October 22. Room 101 East Wing.

This course is designed for the purpose of correlating the undergraduate work in chemistry and as the basis for graduate work for either the master's or doctor's degree. The lectures will deal with the experimental basis for the laws of chemistry and the degree of accuracy to be expected in their application to specific cases. They will also discuss the origin and development of the general theories and the means and extent to which they may be used in organizing and correlating the great mass of chemical facts. Considerable outside work will be required of each student. Prerequisite, graduation from a standard college, with a major in chemistry or the equivalent training in chemistry.

THE HISTORY OF THE FUNDAMENTAL PRINCIPLES OF CHEMISTRY (year).-- Dr. Horace G. Byers. Monday and Friday, beginning October 20. Room 101, East Wing. The course deals primarily with the origin of those priniciples which are common to all phases of chemistry. It attempts to trace their development to the present and to show how and why they vary in form. It also discusses the degree of credibility and accuracy to which they have attained. In a degree it presents a phase of the history of chemistry and also deals somewhat with the philosophy of the subject. Students will be required to do considerable work in the library and present the results of their work in the form of reports. The course is open only to graduate students who have the usual assortment of undergraduate courses in chemistry.

BIOCHEMISTRY ESPECIALLY IN RELATION TO ANIMALS (year. See undergraduate courses for first semester).-- Dr. Paul E. Howe, Tuesday and Thursday, beginning after close of first semester. Room 4-225, Building F.

Second semester.-- The course will deal with selected topics relating especially to body fluids, tissues, excretions, and secretions, with a consideration of physiological activity in relation to biochemical processes.

PLANT GENETICS (one semester).-- Dr. W. B. Kemp. Tuesday and Saturday, beginning October 21. Room 223-24 East Wing. A general course designed to give an insight into the principles of heredity and variation as they are applied in the improvement of plants, together with mutation, genetic equilibrium, and recent attempts to induce artificial modification of the germ plasm.

SOIL GENESIS AND CLASSIFICATION (one semester).-- Dr. Curtis F. Marbut. Monday, Wednesday, and Friday, beginning Monday, December 15. Room 311, Building F, 7th Street, S. W. The purpose of this course is to explain the new genetic concept of soils, the basis and principles of soil classification, and the scheme of classification of the soils of the United States and of the world.

THE POPULATION OF THE SOIL AND ITS SIGNIFICANCE (one semester).-- Dr. Charles Thom. Tuesday and Saturday, beginning October 21. Room 244, West Wing. The course will cover the soil as an environment for microorganisms; Soil populations as reported; groups of organisms represented and certain significant species; biological activities in relation to soil organic matter, soil operations, soil nitrogen, etc.; possibilities of determining soil populations for particular purposes.

ADVANCED STATISTICAL METHODS (year).--. Mr. C.F. Sarle & E.J. Workin Tuesday and Thursday, beginning October 14, 411 Bieber Building.

First semester.-- Theory of sampling and its application to the collection and analysis of statistical data. Special emphasis will be placed on the application of sampling theory in the collection and use of economic statistics and in the development of sound scientific method in the use of quantitative data. Yule's "Introduction to the Theory of Statistics".

Second semester.-- The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work. Attention will be given to the problems involved in time series analysis. All members of the class are expected to provide themselves with an appropriate problem in multiple correlation, preferably something from the field in which they are employed. Dr. Ezekiel's new book, "Methods of Correlation Analysis," will be used with the class. Prerequisites, elementary work in statistics and algebra through simultaneous equations.

ECONOMIC THEORY (year).-- Mr. E. J. Working, Monday and Friday, beginning October 20, Room 505, Crop Estimates, 14th and B, S. W. This course is being given this year instead of the course in Prices and Price Relationships, which has been given for several years past, and this course in economic theory will probably not be repeated in 1931-32. This course is designed for the purpose of assisting the worker in agricultural and business economics and other specialized fields of economics to become better oriented in the general field of economic theory. It is felt that economic theory as well as statistical methods are essential for the best work in the various fields of applied economics. Current theories of value and distribution as developed by the Classical, Austrian, and Neo-Classical schools of economic thought will be analysized and appraised. The course is intended to enable the student to develop an understanding of the "traditional" economic doctrine and to give him a basis for judging the merits of those parts of economic theory concerning which there is ground for divergence of opinion. Some attention will be given to the doctrines as developed by the Historical, Mathematical, and Institutional schools of economics. It is expected that those who take this course for credit will do a large amount of collateral reading and that the class periods will be available principally for discussion. Prerequisites, undergradute work in economic theory and preferably some work in the history of economic thought.

HISTORY OF AMERICAN AGRICULTURE (year).-- Mr. Everett E. Edwards. Tuesday and Thursday, beginning October 21. Room 309, Bieber Building. No prerequisites.

First semester.-- A consideration of the following topics: introduction; European background of American agriculture; geographic factors; Indian agriculture; Indian contributions and influence on agrarian migration; settlement of the English colonies along the Atlantic coast to the time of their revolt; land systems and tenures in the English colonies; agriculture in the thirteen English colonies; trade and markets of agricultural products of the English colonies in America; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture from the American Revolution to the American Civil War; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle.

Second semester.-- The agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement of the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities; domestic and foreign markets; agencies promoting agriculture, -i.e., the Federal and State departments, agricultural education, periodicals, fairs, and societies; agriculture since the agricultural revolution by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population changes and farm tendencies; the agricultural problem during the last decade, analyses and proposed solutions.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (one semester).-- L. H. Bean. Wednesday and Saturday, beginning January 28, 1931. Room 411, Bieber Building. The course will cover the place of agriculture in the various theories of business cycles; the influences of agricultural production and prices on industrial activity, of farm income on the market for industrial products, and of prices on speculation and foreign trade; the influences of industrial conditions, employment, and the buying power of city consumers on agricultural prices, farm expenditures, and net income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).-- Dr. W. B. Kemp. Monday and Friday, beginning October 20. Room 223-24, East Wing. This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text, R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School of this Department or its equivalent.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).-- Mr. Leland B. Clark, Smithsonian Institution. Monday and Wednesday, beginning October 20.(1 1/2 hour periods). Basement of Smithsonian Institution. Practically every research problem calls for some type of glass apparatus or assembly and with the rapid strides made in the last few years with the production of high vacua, the average researcher finds himself almost solely dependent upon a professional glass blower. In this course no assumption will be made of a previous knowledge or ability of glass manipulation. The simple manipulations of joining, bending, and shaping will be carried through to the production of useful apparatus. The different types of glass and their particular uses will be dealt with. Metal in glass and glass to metal seals of all types will be made. This latter procedure plays a very important part in all present electron discharge apparatus. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work, as after all glass blowing demands a certain temperment, together with infinite patience and practice.

BIOCHEMISTRY ESPECIALLY IN RELATION TO ANIMALS (year. See Graduate Courses for second semester).-- Paul E. Howe. Tuesday and Thursday, beginning October 21. Room 4-225. Building F.

First semester.-- A course dealing with the elementary principles of biochemistry, developed with special reference to animals. It will deal with the characteristics of food stuffs, their digestion and the process of digestion, body fluids, such as blood and urine, and the products of excretion, recretion, and body tissues.

INTRODUCTORY ECONOMIC ENTOMOLOGY (one semester).-- C. H. Popenoe. Tuesday and Thursday beginning January 28, 1931. Room H-326, Building F. This course will cover the economic position of the insects, basic principles of classification with outline of the principal economic orders. General insect control, practices including cultural, insecticidal, and biological methods. Fruit and truck insects, forest insects, greenhouse, household and stored product insects and insects affecting man and domestic animals. This will be an undergraduate course prerequisite for advanced courses that may follow.

SYSTEMATIC BOTANY (year).-- Dr. S. F. Blake. Tuesday and Thursday, beginning October 21. Room 110. This course will continue the work of the elementary course in the same subject given last year, with more time devoted to lectures and less to laboratory work. The principal families of flowering plants and ferns will be taken up in systematic order and illustrated by herbarium specimens, with especial reference to the forms occurring in this region, and with somewhat more detailed consideration of the plants of economic importance. The principles of botanical nomenclature will be discussed and some of the most important floras and monographs examined. It is expected that there will be opportunity for some short field trips in the immediate vicinity of Washington.

REVIEW OF MATHEMATICS (year.).-- Dr. W. J. Spillman, Monday and Thursday, beginning October 20. Room H-354, Building C, 6th and B Streets, S. W. This course will treat of theory of exponents, theory and use of logarithms, geometric representation of functions (introduction to analytics), dependent and independent variables, differentials and derivatives (calculus), theory of least squares, solution of observation equations by least squares, and calculation of trend lines.

ELEMENTARY STATISTICAL METHODS (year.)-- C. M. Purves. Monday and Friday, beginning October 20. Room 411, Bieber Building.

First semester.-- The methods, analysis, and presentation of measures describing single series; tabular construction; graphic methods; the organization of statistical investigations; analysis of problem, sources of materials, units, schedules, the use and limitations of sample data; index number constructions. Considerable time will be spent analyzing samples, showing principles underlying methods of editing sample data, testing for accuracy, and the relation between size of sample and the probably error of the results.

Second semester.-- Technique of analysis of the time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

ELEMENTARY STATISTICAL METHODS (one semester).-- C. M. Purves. Wednesday and Saturday, beginning October 22. This course will consist of one semester and is intended to complete the course conducted the last half of the past school year. It will deal with the technique of analysis of the time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description discussion, and study of the methods and results used in actual statistical investigations.

INTERPRETING AGRICULTURE (year).-- M. S. Eisenhower and J. R. Fleming. Tuesday and Thursday, beginning October 21. Room 302, new building. An advanced course in agricultural writing. The course will be built around actual practice in writing interpretative articles on agriculture.

Dr. A. F. Woods,
Director of Scientific Work
and Graduate School.

Dear Doctor Woods:

I expect to take the course checked in the list following:

GRADUATE COURSES

(1) Advanced Inorganic Chemistry
(2) The History of the Fundamental Principles of Chemistry
(3) Biochemistry, Especially in Relation to Animals
(4) Plant Genetics
(5) Soil Genesis and Classification
(6) The Population of the Soil and its Significance
(7) Advanced Statistical Methods
(8) Economic Theory
(9) History of American Agriculture
(10) Business Cycles in Relation to Agriculture
(11) Advanced Course in Statistics for Biological Workers

UNDERGRADUATE COURSES

(12) Glass blowing
(13) Biochemistry, Especially in Relation to Animals
(14) Introductory Economic Entomology
(15) Systematic Botany
(16) Review of Mathematics
(17) Elementary Statistical Methods
(18) Elementary Statistical Methods, to complete second course of which first term was given last school year.
(19) Interpreting Agriculture.
(20) Languages: Scientific German....., French....., Spanish....., Russian.....

If given I will also take a course in .....

.....

Name .....

Address.....

1931

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Director of Scientific Work
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AGRICULTURAL ECONOMICS

August 25
1930

GRADUATE SCHOOL

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G R A D U A T E C O U R S E S

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ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).-- Dr. W. B. Kemp. Monday and Friday, beginning October 20. Room 223-24, East Wing. This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text, R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School of this Department or its equivalent.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).-- Mr. Leland B. Clark, Smithsonian Institution. Monday and Wednesday, beginning October 20.(1 1/2 hour periods). Basement of Smithsonian Institution. Practically every research problem calls for some type of glass apparatus or assembly and with the rapid strides made in the last few years with the production of high vacua, the average researcher finds himself almost solely dependent upon a professional glass blower. In this course no assumption will be made of a previous knowledge or ability of glass manipulation. The simple manipulations of joining, bending, and shaping will be carried through to the production of useful apparatus. The different types of glass and their particular uses will be dealt with. Metal in glass and glass to metal seals of all types will be made. This latter procedure plays a very important part in all present electron discharge apparatus. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work, as after all glass blowing demands a certain temperment, together with infinite patience and practice.

BIOCHEMISTRY ESPECIALLY IN RELATION TO ANIMALS (year. See Graduate Courses for second semester).-- Paul E. Howe. Tuesday and Thursday, beginning October 21. Room 4-225. Building F.

First semester.-- A course dealing with the elementary principles of biochemistry, developed with special reference to animals. It will deal with the characteristics of food stuffs, their digestion and the process of digestion, body fluids, such as blood and urine, and the products of excretion, recretion, and body tissues.

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SYSTEMATIC BOTANY (year).-- Dr. S. F. Blake. Tuesday and Thursday, beginning October 21. Room 110. This course will continue the work of the elementary course in the same subject given last year, with more time devoted to lectures and less to laboratory work. The principal families of flowering plants and ferns will be taken up in systematic order and illustrated by herbarium specimens, with especial reference to the forms occurring in this region, and with somewhat more detailed consideration of the plants of economic importance. The principles of botanical nomenclature will be discussed and some of the most important floras and monographs examined. It is expected that there will be opportunity for some short field trips in the immediate vicinity of Washington.

REVIEW OF MATHEMATICS (year.).-- Dr. W. J. Spillman, Monday and Thursday, beginning October 20. Room H-354, Building C, 6th and B Streets, S. W. This course will treat of theory of exponents, theory and use of logarithms, geometric representation of functions (introduction to analytics), dependent and independent variables, differentials and derivatives (calculus), theory of least squares, solution of observation equations by least squares, and calculation of trend lines.

ELEMENTARY STATISTICAL METHODS (year.)-- C. M. Purves. Monday and Friday, beginning October 20. Room 411, Bieber Building.

First semester.-- The methods, analysis, and presentation of measures describing single series; tabular construction; graphic methods; the organization of statistical investigations; analysis of problem, sources of materials, units, schedules, the use and limitations of sample data; index number constructions. Considerable time will be spent analyzing samples, showing principles underlying methods of editing sample data, testing for accuracy, and the relation between size of sample and the probably error of the results.

Second semester.-- Technique of analysis of the time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

ELEMENTARY STATISTICAL METHODS (one semester).-- C. M. Purves. Wednesday and Saturday, beginning October 22. This course will consist of one semester and is intended to complete the course conducted the last half of the past school year. It will deal with the technique of analysis of the time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description discussion, and study of the methods and results used in actual statistical investigations.

INTERPRETING AGRICULTURE (year).-- M. S. Eisenhower and J. R. Fleming. Tuesday and Thursday, beginning October 21. Room 302, new building. An advanced course in agricultural writing. The course will be built around actual practice in writing interpretative articles on agriculture.

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UNITED STATES DEPARTMENT OF AGRICULTURE
Director of Scientific Work
Washington

September 23,
1930

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GRADUATE SCHOOL

FINAL ANNOUNCEMENT
1930-31

The Graduate School of the United States Department of Agriculture will open with the week beginning October 20. Classes will meet in the Department buildings and will start at 4:40 or as soon thereafter as the students can assemble. Tuition, which is payable in advance, is $25 for two semesters of 30 hours each, or $15 for the first and $10 for the second.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited graduate schools. A limited number of such opportunities will probably be available this year.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employes may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

As shown by the returns from the questionnaire, a number of our students have filed the certificates we issue on request with the Universities of Maryland, Minnesota, Ohio, Wisconsin, Louisiana, Washington, Cornell University, George Washington University, American University, Johns Hopkins University, Yale University, University of Chicago, and Harvard University, and received credit toward the Ph.D, M. A.,M.S., B.A., and B.S. degrees.

A file of the catalogues of the universities of the country, and announcement of courses to be offered by the Bureau of Standards are available for consultation in my office.

Each Chief of Bureau is furnished annually a list of the members of his force registered in the School, together with title of course or courses taken and grade received.

Beginning October 1 the University of Maryland will offer graduate work in chemistry for workers in the Department of Agriculture. Lectures at 6:30 p.m. Monday, Wednesday, and Friday. The course will carry 5 semester credits or 10 for the year. Fee $40 per somester. Following the work in physical chemistry a year course in either organic or advanced inorganic chemistry will be offered.

A. F. Woods
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

ADVANCED INORGANIC CHEMISTRY (year).-- Dr. Horace G. Byers. Wednesday and Saturday, beginning October 22. Room 101 East Wing.

This course is designed for the purpose of correlating the undergraduate work in chemistry and as the basis for graduate work for either the master's or doctor's degree. The lectures will deal with the experimental basis for the laws of chemistry and the degree of accuracy to be expected in their application to specific cases. They will also discuss the origin and development of the general theories and the means and extent to which they may be used in organizing and correlating the great mass of chemical facts. Considerable outside work will be required of each student. Prerequisite, graduation from a standard college, with a major in chemistry or the equivalent training in chemistry.

THE HISTORY OF THE FUNDAMENTAL PRINCIPLES OF CHEMISTRY (year).-- Dr. Horace G. Byers. Monday and Friday, beginning October 20. Room 101, East Wing. The course deals primarily with the origin of those priniciples which are common to all phases of chemistry. It attempts to trace their development to the present and to show how and why they vary in form. It also discusses the degree of credibility and accuracy to which they have attained. In a degree it presents a phase of the history of chemistry and also deals somewhat with the philosophy of the subject. Students will be required to do considerable work in the library and present the results of their work in the form of reports. The course is open only to graduate students who have the usual assortment of undergraduate courses in chemistry.

BIOCHEMISTRY ESPECIALLY IN RELATION TO ANIMALS (year. See undergraduate courses for first semester).-- Dr. Paul E. Howe, Tuesday and Thursday, beginning after close of first semester. Room 4-225, Building F.

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SOIL GENESIS AND CLASSIFICATION (one semester).-- Dr. Curtis F. Marbut. Monday, Wednesday, and Friday, beginning Monday, December 15. Room 311, Building F, 7th Street, S. W. The purpose of this course is to explain the new genetic concept of soils, the basis and principles of soil classification, and the scheme of classification of the soils of the United States and of the world.

THE POPULATION OF THE SOIL AND ITS SIGNIFICANCE (one semester).-- Dr. Charles Thom. Tuesday and Saturday, beginning October 21. Room 244, West Wing. The course will cover the soil as an environment for micro-organisms: Soil populations as reported; groups of organisms represented and certain significant species; biological activities in relation to soil organic matter, soil operations, soil nitrogen, etc.; possibilities of determining soil populations for particular purposes.

ADVANCED STATISTICAL METHODS (year) -- Mr. C. F. Sarle and E. J. Working Tuesday and Thursday, beginning October 21, 411 Bieber Building.

First semester.-- Theory of sampling and its application to the collection and analysis of statistical data. Special emphasis will be placed on the application of sampling theory in the collection and use of economic statistics and in the development of sound scientific method in the use of quantitative data. Yule's "Introduction to the Theory of Statistics".

Second semester.-- The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work. Attention will be given to the problems involved in time series analysis. All members of the class are expected to provide themselves with an appropriate problem in multiple correlation, preferably something from the field in which they are employed. Dr. Ezekiel's new book, "Methods of Correlation Analysis," will be used with the class. Prerequisites, elementary work in statistics and algebra through simultaneous equations.

ECONOMIC THEORY (year). -- Mr. E. J. Working and C. F. Sarle, Monday and Friday, beginning October 20, Room 505, Crop Estimates, 14th and B, S. W. This course is being given this year instead of the course in Prices and the Price Relationships, which has been given for several years past, and this course in economic theory will probably not be repeated in 1931-32. This course is designed for the purpose of assisting the worker in agricultural and business economics and other specialized fields of economics to become better oriented in the general field of economic theory. It is felt that economic theory as well as statistical methods are essential for the best work in the various fields of applied economics. Current theories of value and distribution as developed by the Classical, Austrian and Neo-Classical schools of economic thought will be analysized and appraised. The course is intended to enable the student to develop an understanding of the "traditional" economic doctrine and to give him a basis for judging the merits of those parts of economic theory concerning which there is ground for divergence of opinion. Some attention will be given to the doctrines as developed by the Historical, Mathematical, and Institutional schools of economics. It is expected that those who take this course for credit will do a large amount of collateral reading and that the class periods will be available principally for discussion. Prerequisites, undergraduate work in economic theory and preferably some work in the history of economic thought.

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SCIENTIFIC FRENCH (year). -- Dr. H. B. Humphrey. Monday and Wednesday, beginning October 20. 106 West wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie," Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Prerequisite, a knowledge of the elements of French grammar and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year).-- Dr. Charles Drechsler. Tuesday and Thursday, beginning October 21. Room 33, Basement East Wing. Reading and translation of German scientific prose with some individual work in the preparation of a finished translation of an article in the particular field in which the student may be more directly interested (20 to 30 pages); review of German throughout. Prerequisite, an elementary knowledge of German.

COMMERCIAL SPANISH (year). -- Dr. C. H. Leineweber. Tuesday and Friday, beginning October 21. Room 333, Bieber Building. The purpose of this course is to familiarize the advanced student with the spoken and written language. The special arrangement of the course permits also beginners in Spanish to join.

ADVANCED RUSSIAN (year).-- Dr. C. H. Leineweber. Thursday and Saturday, beginning October 23. Reference Room, Library of the Department, first floor, Bieber Building. The principal phases of Russian literature will be discussed. Reading and interpretation of selected works of representative authors. The Russian mind and its philosophy. A review of the essentials of grammar will be made in order to enable new students to follow the course profitably.

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UNITED STATES DEPARTMENT OF AGRICULTURE
Director of Scientific Work
Washington

AGRICULTURAL EXPERIMENTS U.S. DEPARTMENT OF AGRICULTURE

September 23,
1930

GRADUATE SCHOOL

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A. F. Woods
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First Semester.-- The methods, analysis, and presentation of measures describing single series; tabular construction; graphic methods; the organization of statistical investigations; analysis of problem, sources of materials, units, schedules, the use and limitations of sample data; index number constructions. Considerable time will be spent analyzing samples, showing principles underlying methods of editing sample data, testing for accuracy, and the relation between size of sample and the probable error of the results,

Second semester.-- Technique of analysis of the time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

ELEMENTARY STATISTICAL METHODS (one semester).-- C. M. Purves. Wednesday and Saturday, beginning October 22. Room 411, Bieber Building. This course will consist of one semester and is intended to complete the course conducted the last half of the past school year. It will deal with the technique of analysis of the time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description discussion, and study of the methods and results used in actual statistical investigations.

INTERPRETING AGRICULTURE (year).-- M. S. Eisenhower and J. R. Fleming. Tuesday and Thursday, beginning October 21. Room 302, new building. An advanced course in agricultural writing. The course will be built around actual practice in writing interpretative articles on agriculture.

SCIENTIFIC FRENCH (year). -- Dr. H. B. Humphrey. Monday and Wednesday, beginning October 20. 106 West wing. Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie, Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Prerequisite, a knowledge of the elements of French grammar and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year).-- Dr. Charles Drechsler. Tuesday and Thursday, beginning October 21. Room 33, Basement East Wing. Reading and translation of German scientific prose with some individual work in the preparation of a finished translation of an article in the particular field in which the student may be more directly interested (20 to 30 pages); review of German throughout. Prerequisite, an elementary knowledge of German.

COMMERCIAL SPANISH (year). -- Dr. C. H. Leineweber. Tuesday and Friday, beginning October 21. Room 333, Bieber Building. The purpose of this course is to familiarize the advanced student with the spoken and written language. The special arrangement of the course permits also beginners in Spanish to join.

ADVANCED RUSSIAN (year).-- Dr. C. H. Leineweber. Thursday and Saturday, beginning October 23. Reference Room, Library of the Department, first floor, Bieber Building. The principal phases of Russian literature will be discussed. Reading and interpretation of selected works of representative authors. The Russian mind and its philosophy. A review of the essentials of grammar will be made in order to enable new students to follow the course profitably.

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

January 22
1931

G R A D U A T E S C H O O L

SECOND SEMESTER

The second semester of 13 of the Graduate School courses now under way will begin on the dates hereinafter indicated. In addition 5 other courses will be offered, that is Business Cycles in Relation to Agriculture, Plant Anatomy, Introductory Economic Entomology, French, and Spanish.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited graduate schools.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines, which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

A number of our students have filed the certificates we issue on request with the Universities of Maryland, Minnesota, Ohio, Wisconsin, Louisiana, Washington, Cornell University, George Washington University, American University, Johns Hopkins University, Yale University, University of Chicago, and Harvard University, and received credit toward the Ph.D, M. A., M. S., B. A., and B. S. degrees.

A file of the catalogues of the universities of the country and announcement of courses to be offered by the Bureau of Standards are available for consultation in my office.

Each Chief of Bureau is furnished annually a list of the members of his force registered in the School, together with title of course or courses taken and grade received.

The University of Maryland is conducting graduate work in chemistry for employees of the Department of Agriculture. Lectures at 6:30 p.m. Monday, Wednesday, and Friday. The course carries 5 semester credits or 10 for the year. Fee $40 per semester. Following the work in physical chemistry a year course in either organic or advanced inorganic chemistry will be offered.

A. F. Woods
Director of Scientific Work
and Graduate School.

G R A D U A T E C O U R S E S

ADVANCED INORGANIC CHEMISTRY (year).-- Dr. Horace G. Byers. Wednesday and Saturday, beginning February 9. Room 101 East Wing.

This course is designed for the purpose of correlating the undergraduate work in chemistry and as the basis for graduate work for either the master's or doctor's degree. The lectures will deal with the experimental basis for the laws of chemistry and the degree of accuracy to be expected in their application to specific cases. They will also discuss the origin and development of the general theories and the means and extent to which they may be used in organizing and correlating the great mass of chemical facts. Considerable outside work will be required of each student. Prerequisite, graduation from a standard college, with a major in chemistry or the equivalent training in chemistry.

BIOCHEMISTRY ESPECIALLY IN RELATION TO ANIMALS (year).-- Dr. Paul E. Howe, Tuesday and Thursday, beginning February 10. Room 4-225, Building F.

Second semester.-- The course will deal with selected topics relating especially to body fluids, tissues, excretions, and secretions, with a consideration of physiological activity in relation to biochemical processes.

ADVANCED STATISTICAL METHODS (year)-- Mr. C. F. Sarle and E. J. Working, Tuesday 2 hours, beginning February 10. Room 411 Bieber Building.

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work. Attention will be given to the problems involved in time series analysis. All members of the class are expected to provide themselves with an appropriate problem in multiple correlation, preferably something from the field in which they are employed. Dr. Ezekiel's new book, "Methods of Correlation Analysis," will be used with the class. Prerequisites, elementary work in statistics and algebra through simultaneous equations.

ECONOMIC THEORY (year). -- Mr. E. J. Working and C. F. Sarle, Monday and Friday, beginning February 6, Room 505, Crop Estimates, 14th and B, S. W.

This course is being given this year instead of the course in Prices and the Price Relationships, which has been given for several years past, and this course in economic theory will probably not be repeated in 1931-32. This course is designed for the purpose of assisting the worker in agricultural and business economics and other specialized fields of economics to become better oriented in the general field of economic theory. It is felt that economic theory as well as statistical methods are essential for the best work in the various fields of applied economics. Current theories of value and distribution as developed by the Classical, Austrian and Neo-Classical schools of economic thought will be analysized and appraised. The course is intended to enable the student to develop an understanding of the "traditional"

economic doctrine and to give him a basis for judging the merits of those parts of economic theory concerning which there is ground for divergence of opinion. Some attention will be given to the doctrines as developed by the Historical, Mathematical, and Institutional schools of economics. It is expected that those who take this course for credit will do a large amount of collateral reading and that the class periods will be available principally for discussion. Prerequisites, undergraduate work in economic theory and preferably some work in the history of economic thought.

HISTORY OF AMERICAN AGRICULTURE (year).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning February 10. Room 320, Bieber Building, 1358 B St., S.W. No prerequisites. Second semester may be taken independently from the first.

Second semester.--A consideration of the following topics: agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., the Federal and State departments, agricultural education, periodicals, fairs, and societies; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses and proposed solutions.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (one semester).--L. H. Pean. Wednesday and Saturday, beginning February 28, 1931. Room 411, Bieber Building.

The course will cover the place of agriculture in the various theories of business cycles; the influences of agricultural production and prices on industrial activity, of farm income on the market for industrial products, and of prices on speculation and foreign trade, the influences of industrial conditions, employment, and the buying power of city consumers on agricultural prices, farm expenditures, and net income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture; and methods employed in forecasting business and demand conditions in agricultural outlook reports.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year). --Dr. W. B. Kemp. Monday 2 hours, beginning February 9. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text, R. A. Fisher, Statistical Methods for Research Workers

(also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School of this Department or its equivalent.

PLANT ANATOMY (one semester).-- Ernst Artschwager. Monday, Wednesday, Thursday and Friday, beginning February 9. Room 106, East Wing.

The course is intended primarily for students in applied fields of botany. It deals with the subject matter, literature, and problems of plant anatomy, and is designed to give the student a working acquaintance with the inner structure of vascular plants, with emphasis on interpretation. Those taking the course will be required to study prepared slides and fresh material outside of class and present the results of such studies in the form of drawings and written reports. Besides, each student will be required to make a complete anatomical ontogenetic study of a given plant in order to apply and test the knowledge gained in this course. To facilitate this work there will be at the beginning of the term, a practical demonstration in the most suitable fixing and staining technique and in taking photomicrographs. The course is open to students who have the usual assortment of undergraduate study in botany.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).-- Mr. Leland B. Clark, Smithsonian Institution, Monday and Wednesday, beginning February 9 (1 1/2 hour periods). Basement of Smithsonian Institution.

Practically every research problem calls for some type of glass apparatus or assembly and with the rapid strides made in the last few years with the production of high vacua, the average research finds himself almost solely dependent upon a professional glass blower. The simple manipulations of joining, bending, and shaping will be carried through to the production of useful apparatus, developed during the first semester. Pyrex glass and the various related glasses will be utilized. Metal in glass and glass to metal seals of all types will be made. This latter procedure plays a very important part in all present electron discharge apparatus. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work, as after all glass blowing demands a certain temperment, together with infinite patience and practice.

INTRODUCTORY ECONOMIC ENTOMOLOGY (one semester).-- C. H. Popenoe. Tuesday and Thursday beginning January 27, 1931. Room E-326, Building F.

This course will cover the economic position of the insects, basic principles of classification, with outline of the principal economic orders. General insect control, practices including cultural, insecticidal, and biological methods. Fruit and truck insects, forest insects, greenhouse, household and stored product insects and insects affecting man and domestic animals. This will be an undergraduate course prerequisite for advanced courses that may follow.

SYSTEMATIC BOTANY (year).-- Dr. S. F. Blake. Tuesday and Thursday, beginning February 17. Room 110, West Wing.

This course will continue the work of the elementary course in the same subject given last year, with more time devoted to lectures and less to laboratory work. The principal families of flowering plants and ferns will be taken up in systematic order and illustrated by herbarium specimens, with especial reference to the forms occurring in this region, and with somewhat more detailed consideration of the plants of economic importance. The principles of botanical nomenclature will be discussed and some of the most important floras and monographs examined. It is expected that there will be opportunity for some short field trips in the immediate vicinity of Washington.

ELEMENTARY STATISTICAL METHODS (year).-- C. M. Purves. Monday and Friday, beginning February 9, Room 411, Bieber Building.

Second semester.-- Technique of analysis of the time series; relations between series; simple linear and curvilinear correlation

methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description, discussion, and study of the methods and results used in actual statistical investigations.

ELEMENTARY STATISTICAL METHODS (first semester).--C. M. Purves. Thursday, beginning February 12. Room 411, Bieber Building. 2 hours.

This course will consist of one semester this school year and the second semester beginning with the next school year. It will deal with the technique of analysis of the time series; relations between series; simple linear and curvilinear correlation methods; outline of multiple and curvilinear correlation methods. As much time as possible will be devoted to the description discussion, and study of the methods and results used in actual statistical investigations.

INTERPRETING AGRICULTURE (year).-- M. S. Eisenhower and J. R. Fleming. Tuesday and Thursday, beginning October 21. Room 302, new building.

An advanced course in agricultural writing. The course will be built around actual practice in writing interpretative articles on agriculture.

SCIENTIFIC FRENCH (one semester).-- Dr. H. B. Humphrey. Monday and Wednesday, beginning February 2. 106 West Wing.

Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs, "L'Industrie," Jousier's Economie Rurale, Bonnier's Le Monde Vegetal, etc. Prerequisite, a knowledge of the elements of French grammar and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year).-- Dr. Charles Drechsler. Tuesday and Thursday, beginning March 3. Room 33, Basement East Wing.

Reading and translation of German scientific prose with some individual work in the preparation of a finished translation of an article in the particular field in which the student may be more directly interested (20 to 30 pages); review of German throughout. Prerequisite, an elementary knowledge of German.

BEGINNERS' SPANISH (one semester).--Dr. C. H. Leineweber. Thursday and Saturday (suitable dates will be arranged), beginning February 5. Room 410 Bieber Building.

This course is especially designed to enable the student after mastering the elements of Spanish grammar to read and understand both commercial and agricultural articles written in Spanish.

RUSSIAN (year).--Dr. C. H. Leineweber. Tuesday and Friday, beginning February 10. Room 410 Bieber Building.

Second semester-- The regular and irregular Russian verb, reading, and translating Russian articles on agricultural and kindred subjects.

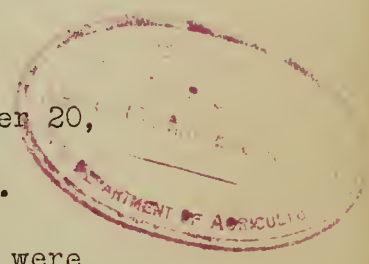
United States Department of Agriculture
Director of Scientific Work
Washington, D. C.

July 1, 1931.

Dr. A. F. Woods, Director of the Graduate School,
and Members of the Graduate School Council.

Gentlemen:

Following is the annual report of the Graduate School of the United States Department of Agriculture for the school year of 1930-31:



The school opened the week beginning October 20, 1930, and the last class was held June 23, 1931.

Twenty-two courses were offered and twenty were conducted, two having been withdrawn because of lack of students. Of the 20 courses given during the year 10 were graduate courses and 10 undergraduate. The graduate courses were--

(1) Advanced Inorganic Chemistry, by Dr. H. G. Byers.
(2) Plant Genetics, by Dr. W. B. Kemp.
(3) Soil Genesis and Classification, by Dr. Curtis F. Marbut.
(4) The Population of the Soil and Its Significance, by Dr. Charles Thom.
(5) Advanced Statistical Methods, by Mr. C. F. Sarle, assisted by Mr. R. Hale and Mr. Oris V. Wells.
(6) Economic Theory, by Mr. E. J. Working.
(7) History of American Agriculture, by Mr. Everett E. Edwards.
(8) Business Cycles in Relation to Agriculture, by Mr. L. H. Bean.
(9) Advanced Course in Statistics for Biological Workers, by Dr. W. B. Kemp.
(10) Plant Anatomy, by Dr. Ernst Artschwager.

The Undergraduate courses were--

(1) Glass Blowing, by Dr. Leland B. Clark.
(2) Biochemistry, Especially in Relation to Animals, by Dr. Paul E. Howe.(second semester graduate work)
(3) Introductory Economic Entomology, by Dr. C. H. Popence.
(4) Systematic Botany, by Dr. S. F. Blake.
(5) Elementary Statistical Methods, by Mr. C. M. Purves, assisted by Mr. F. J. Hosking.
(7) Interpreting Agriculture, by Mr. M. S. Eisenhower, assisted in first semester by Mr. J. R. Fleming.
(8) Intermediate Scientific German, by Dr. Charles Drechsler.
(9) Russian, by Dr. C. H. Leineweber.
(10) Spanish, by Dr. C. H. Leineweber.

Of the 10 graduate courses 4 consisted of 1 semester and 6 of two semesters, and of the 10 undergraduate courses 2 consisted of one semester and 8 of two semesters, one of these latter including also a graduate semester.

The 2 courses withdrawn were--

The History of the Fundamental Principles of Chemistry.
Scientific French.

The number of students registered this year was 505, compared with 331 in 1929-30, 226 in 1928-29, 218 in 1927-28, and 111 in 1926-27.

The following is a brief history of the 20 courses:

	Number students	Tuition $	Salaries $	Surplus $	Deficit $
(1) Advanced Inorganic Chemistry,	16	350.00	300	50.00	00.00
(2) Plant Genetics, 1 semester ..	9	135.00	150		15.00

	Number students	Tuition $	Salaries $	Surplus $	Deficit $
(3) Soil Genesis and Classification	20	311.50	150	161.50	00.00
(4) Population of the Soil and Its Significance	11	145.00	150	00.00	5.00
(5) Advanced Statistical Methods	51	1,110.00	600	510.00	00.00
(6) Economic Theory	27	545.00	300	245.00	00.00
(7) History of American Agriculture	8	204.00	300	00.00	96.00
(8) Business Cycles in Relation to Agriculture	9	129.00	150	00.00	21.00
(9) Advanced Course in Statistics for Biological Workers	23	505.00	300	205.00	00.00
(10) Plant Anatomy	7	165.00	300	00.00	135.00
(11) Glass Blowing	22	383.00	600	00.00	217.00
(12) Biochemistry Especially in Relation to Animals	5	105.00	300	00.00	195.00
(13) Introductory Economic Entomology	14	205.00	150	55.00	00.00
(14) Systematic Botany	15	303.00	300	3.00	00.00
(15) Elementary Statistical (16) Methods	226	3,753.50	1590	2,163.50	00.00
(17) Interpreting Agriculture	15	299.50	450	00.00	150.50
(18) German	10	220.00	300	00.00	80.00
(19) Spanish	7	105.00	150	00.00	45.00
(20) Russian	8	195.00	300	00.00	105.00
	503	9,168.50	6840	3,393.00	1004.50
French (withdrawn)	2	30.00			
	505	9,198.50			

Number of announcements of courses published during the year was 4

Number of announcements of courses distributed 10,000

Number of letters received 413

Number of letters sent out 512

Number of record cards made 506

Number of receipt cards issued 794

It is the policy of the School to bring noted lecturers here to lecture before the students, the members of the Department, and of other departments, and this policy has met with general approval. Last year seven such lecturers were brought here, that is--

Dr. H. H. Whetzel--A new type of plant pathological extension work.

E. R. Wilson, Social Science Research Council, Scientific Method in Economic Research.

J. R. Commons, University of Wisconsin, Evaluating Institutions as a Factor in economic change.

F. H. Knight, University of Chicago, Fact and interpretation in economics.

E. A. Goldenweiser, Federal Reserve Board, Experience in stabilizing price levels.

J. D. Black, Harvard University, Methods of analysis in agricultural economic research.

E. G. Nourse, Institute of Economics, Efforts and achievements in directing economic activities in agriculture.

This year we have had three lectures, that is

Prof. Samuel C. May, University of California, Work of the Bureau of Public Administration, University of California.

Dr. R. A. Fisher, Rothamsted Experiment Station, Development of the modern concepts of statistical theory - two lectures.

The following is a statement regarding finances received and disbursed during the year:

Receipts:		
Amount brought forward from 1929-30	$3,047.01	
Tuition	9,198.50	
Interest on deposits	58.83	
Interest on bonds	63.75	$12,368.09
Expenditures:		
Telegrams and express	3.17	
Treasurer's bond	5.00	
Supplies	528.99	
Refunds	128.00	
Salaries to instructors	6,840.00	
Salaries to secretary and Ass.Treas.	320.00	
Lectures	150.00	
Returned check	15.00	7,990.16
Balance		4,377.93
Government bonds		3,000.00
Grand total		7,377.93

Net balance this year, $1,330.92. It is suggested that the Treasurer be authorized to invest $3,000 in Government bonds.

Nellie E. Bradley

Administrative Assistant,
Secretary Graduate School.

U.S. DEPARTMENT OF AGRICULTURE
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BUREAU OF
AGRICULTURAL ECONOMICS

UNITED STATES DEPARTMENT OF AGRICULTURE

DIRECTOR OF SCIENTIFIC WORK

WASHINGTON, D. C.

August 1
1931

GRADUATE SCHOOL

PRELIMINARY ANNOUNCEMENT

The Graduate School of the United States Department of Agriculture will open with the week beginning October 19. Classes will meet in the Department buildings and will start at 4:40 or as soon thereafter as the students can assemble. Tuition is payable in advance and is $25 for two semesters, or $15 for the first semester and $10 for the second.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited schools. A limited number of such opportunities will probably be available this year.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employes may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree.

A number of our students have filed certificates, which we issue on request, with various universities,

for example, the Universities of M aryland, Minnesota, Ohio, Wisco nsin, Louisiana, Washington, Cornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph. D., M. A., M. S., B. A., and B. S. degrees.

A file of the catalogues of universities and Land Grant Colleges and announcement of courses to be offered by the Bureau of Standards are available for consultation in my office.

Each Chief is furnished annually a list of the members of his force registered in the Graduate School during the school year, together with title of the course or courses taken and grade or grades received.

Besides the courses outlined in the following pages others will be added if the demand is sufficient.

The University of Maryland announces a course in Advanced Organic Chemistry for men in this Department. The course will be the equivalent of five semester credits, three lectures and two laboratory. Arrangements can be made to take the lectures without the laboratory work. The class will convene in Room 107, Chemistry Building, at 6:30 p.M. October 1. Fee $40.

A list of the courses which we plan to offer will be found on the last page. Each person interested is requested to check the course or courses he expects to take, fill in the blanks, detach the sheet, and return it to me as soon as possible.

A. F. Woods,
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

ADVANCED INORGANIC CHEMISTRY (year).--Dr. Horace G. Byers. Wednesday and Saturday, beginning October 21. Room 101, East Wing.

This course is designed for the purpose of correlating the undergraduate work in chemistry and as the basis for graduate work for either the master's or the doctor's degree. The lectures will deal with the experimental basis for the laws of chemistry and the degree of accuracy to be expected in their application to specific cases. They will also discuss the origin and development of the general theories and the means and extent to which they may be used in organizing and correlating the great mass of chemical facts. Considerable outside work will be required of each student. Prerequisites, graduation from a standard college, with a major in chemistry, or the equivalent training in chemistry.

CONTROL OF PLANT DISEASES (year). Monday and Wednesday, and Friday, beginning October 19. Room 110, East Wing.

The present status of successful control of all types of plant diseases arranged mainly on a crop basis. Without minimizing the importance of the use of fungicides particular attention will be paid to the newer and unusual methods of plant-disease prevention and control. The lectures will include the study of plant pathology, including cause, life history of parasites, infection methods, and behavior of diseases sufficient to give the student the reason for the various treatments. Some of the information will not be found in books, bulletins, or journals, but publications will be freely cited for reading or reference during the course. While not intended as a complete course in plant pathology the lectures will include sufficient pathological information to enable the student to understand the theory of successful treatments. In addition to the following list of instructors there will be others from time to time.

Instructors

Introduction and general methods.....Dr. M. B. Waite
Deciduous orchard fruits.....Dr.M.B.Waite
Dr. John W. Roberts

Cranberries, grapes, and small fruits...Dr.C.L.Shear
Citrus and subtropical fruits.....Prof.Harry R.Fulton
Fruits in transportation, storage, and
on the market.....Dr.Charles Brooks
Vegetables.....Dr.L.L.Harter
Ornamental and Greenhouse plants.....Dr.Freeman Weiss
Forest and ornamental trees and shrubs..Dr.Haven Metcalf
Cereals.....Dr.H.B.Humphrey
Sugar plants.....Dr.E.L.Brandes
Cotton.....Mr.W.W.Gilbert
Tobacco.....Dr.E.E.Clayton

"PHASE RULE" (one semester).--Dr. Malcolm M. Haring, Professor of Physical Chemistry, University of Maryland. Tuesday and Thursday, beginning October 20. Room 32, West Wing.

A systematic study of heterogeneous equilibria--one, two, and three component systems, and also reciprocal salt pairs, with practical application of each

CATALYSIS (one semester).--Dr. Malcolm M. Haring. Tuesday and Thursday, beginning at close of course on "phase Rule." Room 32, West Wing.

This course consists of lectures on the theory and applications of Catalysis.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning October 20. Room 223-24, East Wing.

A development of the genetic principles that underlie plant breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modify germplasm, and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).--Dr. W. B. Kemp. Monday, 2 hours, beginning October 19. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text

R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester).--Staff will be announced later Tuesday and Thursday beginning with second semester (date of beginning will appear in next announcement). Room 110, West Wing.

A composite course by workers in this Department, the Bureau of Standards, and other laboratories. One or more lectures by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of the most important instruments, especially those in which new technique has been developed, which may be applied in the solution of biological or other problems. Those interested may obtain a list of subjects and lectures in my office. When practicable Room 110, headquarters of the class, will be used. Many meetings of the class will necessarily be held in laboratories where the special apparatus is installed.

THE POPULATION OF THE SOIL AND ITS SIGNIFICANCE (one semester).--Dr. Charles Thom. Tuesday and Saturday, beginning October 20. Room 244, West Wing.

The course will cover the soil as an environment for microorganisms; soil populations as reported; groups of organisms represented and certain significant species; biological activities in relation to soil organic matter, soil operations, soil nitrogen, etc.; possibilities of determining soil populations for particular purposes.

ADVANCED STATISTICAL METHODS (year).--Instructor will be announced later. Tuesday, 2 hours, beginning October 20. Room 411, Bieber Building.

First semester.--Theory of sampling and its application to the collection and analysis of statistical data. Special emphasis will be placed on the application of sampling theory in the collection and use of economic statistics and in the development of sound scientific method in the use of quantitative data. Yule's Introduction to the Theory of Statistics.

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work. Attention will be given to the problems involved in time series analysis. All members of the class are expected to provide themselves with an appropriate problem in multiple correlation, preferably something from the field in which they are employed. Doctor Ezekiel's new book, Methods of Correlation and Analysis, will be used with the class. Prerequisites, elementary work in statistics and angebra through simultaneous equations.

HISTORY OF AMERICAN AGRICULTURE (year).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning October 20. Room 320, Bieber Building, 1358 B St., S. W. No prerequisites.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic coast; indigenous and foreign contributions to American agriculture--Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influence, Spanish contributions; land system and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during thessame period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the second struggle.

Second semester.--A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, andlyses and proposed solutions.

and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analysis, and proposed solutions.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (one semester).--Mr. L. H. Bean. Wednesday and Saturday, beginning October 21. Room 500, Crop Estimates, Corner 14th and B Streets, S. W.

The course will cover the place of agriculture in the various theories of business cycles; the influences of agricultural production on industrial activity, of farm income on the market for industrial products, and of prices on agricultural and industrial production on speculation and foreign trade; the influences of industrial conditions, employment, and the buying power of city consumers on agricultural prices, farm expenditures, and net income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture; and methods employed in forecasting business and demand conditions in agricultural outlook reports.

PLANT ANATOMY (year).--Dr. Ernst Artschwager. Saturday, 1 o'clock, beginning October 24 (suitable hours will be arranged later with the class). Room 401, West Wing.

The course is intended primarily for students in applied fields of botany. It deals with the subject matter, literature, and problems of plant anatomy, and is designed to give the student a working acquaintance with the inner structure of vascular plants, with emphasis on interpretation. Those taking the course will be required to study prepared slides and fresh material outside of class and present the results of such studies in the form of drawings and written reports. Besides, each student will be required to make a complete anatomical ontogenetic study of a given plant in order to apply and test the knowledge gained in this course. To facilitate this work there will be at the beginning of the term a practical demonstration in the most suitable fixing and staining technique and in taking photomicrographs. The course is open to students who have the usual assortment of undergraduate study in botany. Eames and McDaniels Plant Anatomy will be used as text book.

PHOTO-CHEMICAL REACTIONS IN BIOLOGICAL PHENOMENA (year).--Dr. F. S. Brackett. Days on which classes will be held and description of course will be given in final announcement.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Dr. Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hour, beginning October 19. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, or biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulations of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

ELEMENTARY STATISTICAL METHODS (year).--C. M. Purves and F. J. Hosking. Monday and Friday, beginning October 19. Room 411, Bieber Building.

First semester.--First half of the course is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures use of dispersion, construction, and significances of index numbers, and the analysis of time series data.

Second semester.--The second semester is devoted entirely to the different phases of correlation, starting in with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and linear multiple correlation. The object of this semester is to enable the students to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ELEMENTARY STATISTICAL METHODS (second semester).--C. M. Purves. Thursday, 2 hours, beginning October 22. Room 411, Bieber Building.

Second semester.--This course will be a continuation of the first semester started in the middle of the last school year. It will be devoted entirely to the different phases of correlation, starting in with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and linear multiple correlation. The object of the course is to enable the students to apply correlation to any type of data and to understand the significances of the different measures of correlation.

SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Monday and Wednesday, beginning October 19. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

INTRODUCTORY ENTOMOLOGY AND INSECT ECOLOGY (year).--Dr. C. H. Popenoe. Tuesday and Thursday, beginning October 20. Room H-326, Building F.

First semester.-- Economic entomology. This course will cover the economic position of the insects, basic principles of classification, with outline of the principal economic orders. General insect control, practices including cultural, insecticidal, and biological methods. Fruit and truck insects, forest insects, greenhouse, household, and stored-product insects, and insects affecting man and domestic animals.

Second semester.--Insect ecology. The relationships of insects to their habitats and biotic communities and to the natural phenomena of their associates therein.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, and RELATED SUBJECTS (one semester).--Dr. M. C. Merrill, and editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Tuesday and Thursday, beginning October 20. Room 538, Administration Building.

This course is intended primarily for those in the Department of Agriculture who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work done will be carefully scrutinized and criticised.

SCIENTIFIC FRENCH (one semester).--Dr. H. B. Humphrey. Monday and Wednesday, beginning October 19. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's le Livre des Champs and L'Industrie, Jousier's Economie Rurale, Bonnier's French Grammar, and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning October 20. Room 33, basement of East Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, phys-

ics, etc.), supplemented by a review of German grammar throughout the year, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge had lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader, Joynes Wesselhoeft's German Lesson Grammar.

ELEMENTARY RUSSIAN (year).--Dr. C.H.Leineweber. Wednesday and Thursday (suitable dates will be arranged with the class), beginning October 21. Room 410, Bieber Building.

This course is especially designed to enable the student after mastering the elements of Russian grammar to make translations of scientific articles on agricultural subjects.

ADVANCED RUSSIAN (year).--Dr. C. H. Leineweber. Tuesday and Friday, beginning October 20. Room 410, Bieber Building.

Reading and translations of Russian scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Prerequisite, two semesters of Russian grammar and reading.

SPANISH I AND II (year).--Dr. C. H. Leineweber. Students interested in either elementary or more advanced Spanish will report to Room 410, Bieber Building, Monday, October 19, 5 p.m., for registration and arrangement of suitable dates.

Dr. A. F. Woods,
Director of Scientific Work
and Graduate School.

Dear Doctor Woods:

I expect to take the course or courses checked in the following list:

GRADUATE COURSES

(1) Advanced Organic Chemistry
(2) Control of Plant Diseases
(3) "Phase Rule."
(4) Catalysis
(5) Plant Genetics
(6) Advanced Course in Statistics for Biological Workers
(7) Scientific Instruments and their Use
(8) The Population of the Soil and its Significance
(9) Advanced Statistical Methods
(10) History of American Agriculture
(11) Business Cycles in Relation to Agriculture
(12) Plant Anatomy
(13) Photo-Chemical Reactions in Biological Phenomena

UNDERGRADUATE COURSES

(1) Glass Blowing
(2) Elementary Statistical Methods
(3) Elementary Statistical Methods (second semester)
(4) Systematic Botany
(5) Economic Entomology and Insect Ecology
(6) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(7) Scientific French
(8) Intermediate Scientific German
(9) Elementary Russian
(10) Advanced Russian
(11) Spanish I and II

If given I will also take a course in .....

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Name.....

Address.....

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1931

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON, D. C.

September 14
1931

LIBRARY
BUREAU OF
AGRICULTURAL ECONOMICS

GRADUATE SCHOOL

FINAL ANNOUNCEMENT

The Graduate School of the United States Department of Agriculture will open with the week beginning October 19. Classes will meet in the Department buildings and will start at 4:40 or as soon thereafter as the students can assemble. Tuition, payable in advance, is $25 for two semesters, for each course, or $15 for the first semester and $10 for the second.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited schools. A limited number of such opportunities will probably be available this year.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement.

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employes may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

A file of the catalogues of universities and Land Grant Colleges and announcement of courses to be offered by the Bureau of Standards are available for consultation in my office.

Each Chief is furnished a list of the members of his force registered in the Graduate School during the school year, together with title of the course or courses taken and grade or grades received.

Besides the courses outlined in the following pages others will be added if the demand is sufficient.

The University of Maryland announces a course in Advanced Organic Chemistry for men in this Department. The course will be the equivalent of five semester credits, three lectures and two laboratory. Arrangements can be made to take the lectures without the laboratory work. The class will convene in Room 107, Chemistry Building, at 6:30 p.m., October 1. Fee $40.

A. F. Woods,
Director of Scientific Work
and Graduate School.

G R A D U A T E C O U R S E S

ADVANCED INORGANIC CHEMISTRY (year).--Dr. Horace G. Byers. Wednesday and Saturday, beginning October 21. Room 101, East Wing.

This course is designed for the purpose of correlating the undergraduate work in chemistry and as the basis for graduate work for either the master's or the doctor's degree. The lectures will deal with the experimental basis for the laws of chemistry and the degree of accuracy to be expected in their application to specific cases. They will also discuss the origin and development of the general theories and the means and extent to which they may be used in organizing and correlating the great mass of chemical facts. Considerable outside work will be required of each student. Prerequisites, graduation from a standard college, with a major in chemistry, or the equivalent training in chemistry.

CONTROL OF PLANT DISEASES (year). Monday, Wednesday, and Friday, beginning October 19. Room 110, East Wing.

The present status of successful control of all types of plant diseases arranged mainly on a crop basis. Without minimizing the importance of the use of fungicides particular attention will be paid to the newer and unusual methods of plant-disease prevention and control. The lectures will include the study of plant pathology, the cause, life history of parasites, infection methods, and behavior of diseases sufficient to give the student the reason for the various treatments. Some of the information will not be found in books, bulletins, or journals, but publications will be freely cited for reading or reference during the course. While not intended as a complete course in plant pathology the lectures will include sufficient pathological information to enable the student to understand the theory of successful treatments. In addition to the following list of instructors there will be others from time to time:

Instructors

Introduction and general methods.....Dr. M. B. Waite
Deciduous orchard fruits.....Dr.M.B. Waite
Dr. John W. Roberts
Cranberries, grapes, and small fruits...Dr.C.L. Shear
Citrus and subtropical fruits.....Prof. Harry R. Fulton
Fruits in transportation, storage, and
on the market.....Dr. Charles Brooks
Vegetables.....Dr. L.L. Harter
Ornamental and Greenhouse plants.....Dr. Freeman Weiss
Forest and ornamental trees and shrubs..Dr. Haven Metcalf
Cereals .....Dr. H.B. Humphrey
Sugar plants.....Dr. E.W. Brandes
Cotton.....Mr. W.W. Gilbert
Tobacco.....Dr. E.E. Clayton

"PHASE RULE" (one semester).--Dr. Malcolm H. Haring, Professor of Physical Chemistry, University of Maryland. Tuesday and Thursday, beginning October 20. Room 32, West Wing.

A systematic study of heterogeneous equilibria--one, two, and three component systems, and also reciprocal salt pairs, with practical application of each.

CATALYSIS (one semester).--Dr. Malcolm H. Haring. Tuesday and Thursday, beginning at close of course on "Phase Rule." Room 32, West Wing.

This course consists of lectures on the theory and applications of Catalysis.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning October 20. Room 223-24, East Wing.

A development of the genetic principles that underlie plant breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modify germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).--Dr. W. B. Kemp. Monday, 2 hours, beginning October 19. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text

R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester).--Tuesday and Thursday, beginning February 2. Room 110, West Wing.

A composite course by workers in this Department, the Bureau of Standards, and other laboratories. One or more lectures by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of the most important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Many meetings of the class will necessarily be held in laboratories where the special apparatus is installed.

Because of the composite nature of the course and the number of lecturers minor changes may be necessary as it proceeds. The list of lectures and lecturers is as follows:

(1) Methods of computing; degree of accuracy; probable error.
R.W. French
(2) Ohm's law and the Wheatstone bridge.
C.H. Kunsman
(3) Measurement of temperature, particularly in the biological range.
S.G. Brickwedde
(4) Measurement of humidity.
S.G. Brickwedde
(5) Regulation of temperature and humidity in incubators.
J.T. Bowen
(6) Solar radiotion measurements.
H.H. Kimball
(7) Upper air measurements.
W.R. Gregg
(8) Meteorological instruments.
C.F. Marvin
(9) Assembling and interpreting meteorological data.
R.H. Weightman
(10) Spectrum analysis, visible, infra-red and ultra-violet.
O.R. Wulf
(11) Measurement of light in relation to photosynthesis.
F.S. Brackett
(12) Equipment for growing plants under controlled conditions.
W.W. Garner
(13) Measuring and recording time intervals.
R.W. French
(14) Oscillograph and other electrical recording methods.
R.W. French

(15) Photo-electric cell; grid glow tubes; amplification.
R.W. French
(16) Nephelometer.
E.D. McAllister
(17) Spectrophotometer.
R.W. French
(18) The microscope in identification of organic and inorganic compounds.
W.H.Fry
(19) Photomicrography.
R.W. French
(20) Measurement of colloidal particles.
G.E. Holm
(21) Measurement of Brownian movement and Cataphoresis.
M.S. Anderson
(22) X-ray equipment and use.
S.B. Hendricks
(23) Supersonic phenomena.
L.B. Olmstead
(24) Micro-determinations.
E.P. Clark
(25) Hydrogen-ion determinations.
B.C. Brunstetter
(26) Measurement of rate of oxidation.
G.R. Greenbeck
(27) Methods and apparatus for gas analysis.
E.R. Weaver
(28) Methods of low temperature distillation.
E.W. Washburn
(29) Measurement of low pressures.
C.H. Kunsman

THE POPULATION OF THE SOIL AND ITS SIGNIFICANCE (one semester).--Dr. Charles Thom. Tuesday and Saturday, beginning October 20. Room 244, West Wing.

The course will cover the soil as an environment for microorganisms; soil populations as reported; groups of organisms represented and certain significant species; biological activities in relation to soil organic matter, soil operations, soil nitrogen, etc.; possibilities of determining soil populations for particular purposes.

ADVANCED STATISTICAL METHODS (year).--Mr. M.J.B. Ezekiel, assisted by Mr. B.R. Stauber. Tuesday, 2 hours, beginning October 20. Room 411, Bieber Building.

First semester.--Theory of sampling and its application to the collection and analysis of statistical data. Special emphasis will be placed on the application of sampling theory in the collection and use of economic statistics and in the development of sound scientific method in the use of quantitative data. Yule's Introduction to the Theory of Statistics.

Second semester.--The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work. Attention will be given to the problems involved in time series analysis. All members of the class are expected to provide themselves with an appropriate problem in multiple correlation, preferably something from the field in which they are employed. Doctor Ezekiel's new book, Methods of Correlation and Analysis, will be used with the class. Prerequisites, elementary work in statistics and algebra through simultaneous equations.

HISTORY OF AMERICAN AGRICULTURE (year).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning October 20. Room 320, Bieber Building, 1358 B St., S. W. No prerequisites.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic coast; indigenous and foreign contributions to American agriculture--Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influence, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle.

Second semester.--A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses and proposed solutions.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (year).--Mr. L. H. Bean. Wednesday and Saturday, beginning October 21. Room 500, Crop Estimates, Corner 14th and B Streets, S. W.

First semester.--This part of the course will cover, among other subjects, the following: Evidences of business cycles as derived from (a) statistics of production, trade bank clearings, employment, foreign trade, and (b) business annals; theories of business cycles; methods of measuring business cycles; characteristics of business cycles; business cycles and prices of commodities, stocks, credit (interest rates), labor (wages); international aspects of business cycles; methods of forecasting business cycles; an appraisal of commercial forecasts of business; lessons from the 1930-31 depression concerning business cycles.

Second semester.--This semester will deal with certain interrelations between business and agriculture, such as the place of agriculture in the various theories of business cycles; the influences of agricultural production on industrial activity, of farm income on the market for industrial products, and of prices on agricultural and industrial production, speculation, and foreign trade; the influences of industrial conditions, employment, and the buying power of urban consumers on agricultural prices, farm expenditures, and net farm income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture; methods employed in forecasting agricultural production prices and income; and methods employed in forecasting business and demand conditions in agricultural outlook reports.

PLANT ANATOMY (year).--Dr. Ernst Artschwager. Saturday, 1 o'clock, beginning October 24 (suitable hours will be arranged later with the class). Room 401, West Wing.

The course is intended primarily for students in applied fields of botany. It deals with the subject matter, literature, and problems of plant anatomy, and is designed to give the student a working acquaintance with the inner structure of vascular plants, with emphasis on interpretation. Those taking the course will be required to study prepared slides and fresh material and present the results of such studies in the form of drawings and written reports. Besides, each student will be required to make a complete anatomical ontogenetic study of a given plant in order to apply and test the knowledge gained in this course. To facilitate this work there will be at the beginning of the term a practical demonstration in the most suitable fixing and staining technique and in taking photomicrographs. The course is open to students who have the usual assortment of undergraduate study in botany. Eames and McDaniels Plant Anatomy will be used as text book.

PHOTO-CHEMICAL REACTIONS IN BIOLOGICAL PHENOMENA (year).--
Dr. F. S. Brackett. Monday, 2 hours, beginning October 19.
Fifth Floor of the Tower, Smithsonian Institution.

Introduction dealing with fundamentals of spectroscopy and photochemistry (Ref. Kistiakowsky, George B., Photochemical processes). Biological photochemical reactions of particular interest will be studied in detail, including photosynthesis (Ref. Stiles, W., Photosynthesis, and Spoehr, H. A., Photosynthesis) and phototropism. Discussion will include both theory and methods of observation.

GENERAL PROTOZOOLOGY (one semester).-- Dr. Ena A. Allen.
Lectures Monday and Wednesday, beginning October 19, and two laboratory periods of three hours each (Time for laboratory periods to be determined later). Room 250 East Wing.

This course will cover both free-living and parasitic forms. It will consist of a study of the morphology, life history, taxonomic relationship, and geographical distribution, in addition to the various methods of technique necessary for the study of the protozoa.

PRICES AND PRICE RELATIONSHIPS (one semester).--
E. J. Working. Monday and Friday, 1 1/2 hour sessions, beginning October 19. Room 500 Crop Estimates, 14th and B.Sts., S. W.

Price changes and price-making forces will be studied from the standpoint of the theory of prices and from the standpoint of the problems involved in price analysis and price forecasting. Consideration will be given to the behavior of prices of individual commodities as determined by the various factors of supply and demand which are peculiar to those commodities and to factors affecting the general price level. Attention will be given to the quantity theory of money and the theory of international prices in the light of actual price movements. Prospective students should have a knowledge of elementary economic theory and elementary statistics.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Dr. Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning October 19. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

ELEMENTARY STATISTICAL METHODS (year).--C. M. Purves and F. J. Hosking. Monday and Friday, beginning October 19. Room 411, Bieber Building.

First semester.--First half of the course is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, construction and significance of index numbers, and the analysis of time series data.

Second semester.--The second semester is devoted entirely to the different phases of correlation, starting in with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and linear multiple correlation. The object of this semester is to enable the students to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ELEMENTARY STATISTICAL METHODS (second semester).--C. M. Purves. Thrusday, 2 hours, beginning October 22. Room 411, Bieber Building.

Second semester.--This course will be a continuation of the first semester started in the middle of the last school year. It will be devoted entirely to the different phases of correlation, starting in with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and linear multiple correlation. The object of the course is to enable the students to apply correlation to any type of data and to understand the significance of the different measures of correlation.

SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Monday and Wednesday, beginning October 19. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

INTRODUCTORY ENTOMOLOGY AND INSECT ECOLOGY (year).--Dr. C. W. Popenoe. Tuesday and Thursday, beginning October 20. Room H-326, Building F.

First semester.--Economic entomology. This course will cover the economic position of the insects, basic principles of classification, with outline of the principal economic orders; general insect control, practi-

Second semester.--Insect ecology. The relationships of insects to their habitats and biotic communities and to the natural phenomena of their associates therein. This course is intended to outline the effects of the complete environment, physical, climatological, and biotic, on the population of insects; the general life processes of insects, the results of changes in climate, plant associations, cultivation, and other animal competitors on these processes; the bases for biological and cultural control and how to determine, analyze, and organize them.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, and RELATED SUBJECTS (one semester).--Dr. M. C. Merrill, and editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Tuesday and Thursday, beginning October 20. Room 538, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

SCIENTIFIC FRENCH (one semester).--Dr. H. B. Humphrey. Monday and Wednesday, beginning October 19. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's le Livre des Champs and L'Industrie, Jousier's Economic Rurale, Bonnier's French Grammer, and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning October 20. Room 37, basement of East Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the year, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader, Joynes Wesselhoeft's German Lesson Grammar.

ELEMENTARY RUSSIAN (year).--Dr. C. H. Leineweber. Wednesday and Thursday (suitable dates will be arranged with the class), beginning October 21. Room 410, Bieber Building.

This course is especially designed to enable the student after mastering the elements of Russian grammar to make translations of scientific articles on agricultural subjects.

ADVANCED RUSSIAN (year).--Dr. C. H. Leineweber. Tuesday and Friday, beginning October 20. Room 410, Bieber Building.

Reading and translations of Russian scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Prerequisite, two semesters of Russian grammar and reading.

SPANISH I AND II (year).--Dr. C. H. Leineweber. Students interested in either elementary or more advanced Spanish will report to Room 410, Bieber Building, Monday, October 19, 5 p.m., for registration and arrangement of suitable dates.

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

October 8
1931

To Directors, Chiefs of Bureaus, members of the Department, and to our friends:

You are cordially invited to attend a lecture, under the auspices of the Graduate School, on THE FOLK HIGH SCHOOL AND ITS INFLUENCE ON RURAL LIFE AND WORK, by Dr. Jakob E. Lange, Principal of the Peasants' Folk School, Odense, Denmark, at 3 o'clock, October 23, in the Auditorium of the U. S. National Museum.

Doctor Lange is one of the leading scholars of Denmark, is well known in England, and is versatile in the English Language. He is not only a scientist, but is especially interested in the human side of rural life. He is planning to lecture at several universities and colleges in this country while on his trip, which he is making for the purpose of a comparative study of American and European flora. It is believed his lecture while here will be interesting and instructive.

Yours very truly,

A. F. Woods.

A. F. Woods
Director of Scientific Work.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

SS LACY.

October 31
1931

ILLUSTRATED LECTURES ON MYCORRHIZA BY DR. M. C. RAYNER
UNDER THE AUSPICES OF THE GRADUATE SCHOOL

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Two lectures on mycorrhiza will be given, one November 10 and one November 11, by Dr. M. C. Rayner, of Bedford College for Women, University of London, at the National Museum, beginning at 3 o'clock.

The lecture November 10 will be on Review of Modern Work on Orchidaceae and Ericaceae--Introductory and historical, the mycorrhiza of orchids, symbiotic and asymbiotic methods of germination, the mycorrhiza of Calluna and other members of Ericaceae, aseptic germination of seed, the obligate habit in orchids and heaths.

The lecture November 11 will be on The Mycorrhiza of trees--Recent Experimental Work on Tree Mycorrhiza.--Historical, Melin's work on tree mycorrhiza, its significance in nutrition and possible significance in relation to practical forestry problems, recent experimental work bearing on the afforestation of non-woodland soils.

Doctor Rayner's work on mycorrhiza, as summarized in her book on this subject, is too well known to require comment. With Melin she is unquestionably the leading investigator in the field. The lectures are open to all interested.

Yours very truly,

A. F. Woods.

Director of Scientific Work

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

MISS LACY.

December 28
1931

LECTURE ON QUICK FREEZING AND ITS IMPLICATIONS FOR THE DISTRIBUTION OF FOOD PRODUCTS

Dr. Clarence Birdseye, head of the Research Laboratory of Frosted Foods, Inc., Glouster, Massachusetts, will give a lecture, under the auspices of the Graduate School, on Quick Freezing and its Implications for the Distribution of Food Products, in the auditorium of the National Museum January 6, 1932, beginning at 3 o'clock.

The lecture should be of special interest to members of the Extension Service, Bureau of Chemistry and Soils, Bureau of Agricultural Economics, Bureau of Plant Industry, Bureau of Animal Industry, Bureau of Home Economics, Bureau of Fisheries, the Division of Foodstuffs of the Bureau of Foreign and Domestic Commerce, Department of Commerce, and the District of Columbia Home Economics Association.

The lecture is free to all who wish to attend.

A. F. Woods
Director of Scientific Work.

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON, D. C.

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U.S. DEPARTMENT OF AGRICULTURE

January 18
1932

GRADUATE SCHOOL

SECOND SEMESTER

The second semester of the courses given by the Graduate School of the United States Department of Agriculture will open on the dates given under description of the courses. Three additional courses will be offered, that is Scientific Instruments and their use, Introduction to Enzyme Chemistry, and Elementary Statistical Economics. Classes will meet in the Department buildings and will start at 4:40 or as soon thereafter as the students can assemble. Tuition, payable in advance, is $25 for two semesters, for each course, or $15 for the first semester and $10 for the second.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Such work and the credit to be granted should be arranged through the Deans of accredited schools. A limited number of such opportunities will probably be available this year.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement.

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

A file of the catalogues of universities and Land Grant Colleges and announcement of courses offered by the Bureau of Standards are available for consultation in my office.

Each Chief is furnished a list of the members of his force registered in the Graduate School during the school year, together with title of the course or courses taken and grade or grades received.

The University of Maryland is giving a course in Advanced Organic Chemistry for men in this Department. The course is the equivalent of five semester credits, three lectures and two laboratory. Arrangements can be made to take the lectures without the laboratory work. The class convenes in Room 107, Chemistry Building, University of Maryland, at 6:30 p.m., Fee $40.

A. F. Woods,
Director of Scientific Work
and Graduate School.

G R A D U A T E C O U R S E S

CONTROL OF PLANT DISEASES-(Second Semester)- Monday, Wednesday, and Friday, began January 8. Conference Room, second floor, 220- 14th St., S.W.

The present status of successful control of all types of plant diseases arranged mainly on a crop basis. Without minimizing the importance of the use of fungicides particular attention will be paid to the newer and unusual methods of plant-disease prevention and control. The lectures will include the study of plant pathology, the cause, life history of parasites, infection methods, and behavior of diseases sufficient to give the student the reason for the various treatments. Some of the information will not be found in books, bulletins, or journals, but publications will be freely cited for reading or reference during the course. While not intended as a complete course in plant pathology the lectures will include sufficient pathological information to enable the student to understand the theory of successful treatments.

Instructors

Cereals (Continued)	Dr. H.B. Humphrey
Ornamental trees and shrubs	Dr. Haven Metcalf
Sugar plants	Dr. E.W. Brandes and Dr. G.H. Coons
Cotton	Mr. W.W. Gilbert
Rubber plants	Dr. R.D. Rands
Forage crops, grasses, etc.	Dr. John Monteith
Tobacco	Dr. E. E. Clayton
Foreign quarantines	Mr. N. Rex Hunt
Domestic quarantines	Dr. S.B. Fracker
Fungicides	Dr. John W. Roberts
Nuts, tea, drug, nonparasitic, spraying equipment, summary and principles	Dr. M. B. Waite

CATALYSIS (Second semester).--Dr. Malcolm M. Haring. Tuesday and Thursday, beginning at dose of course on "Phase Rule." Conference Room of Extension Service, Room 206-12, 220 - 14th St. S. W.

This course consists of lectures on the theory and applications of Catalysis.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (Second semester)-- Dr. W. B. Kemp. Monday, 2 hours, beginning xxxxxxx after close of first semester. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

SCIENTIFIC INSTRUMENTS AND THEIR USE (One semester).--Tuesday and Thursday, beginning February 2. Room 110, West Wing.

A composite course by workers in this Department, the Bureau of Standards, and other laboratories. One or more lectures by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of the most important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Many meetings of the class will necessarily be held in laboratories where the special apparatus is installed.

Because of the composite nature of the course and the number of lecturers minor changes may be necessary as it proceeds. The list of lectures and lecturers is as follows:

(1) Methods of computing; degree of accuracy; probable error.
R.W. French
(2) Ohm's law and the Wheatstone bridge.
C.H. Kunsman
(3) Measurement of temperature, particularly in the biological range.
S.G. Brickwedde
(4) Measurement of humidity.
S.G. Brickwedde
(5) Regulation of temperature and humidity in incubators.
J.T. Bowen
(6) Solar radiation measurements.
H.H. Kimball
(7) Upper air measurements.
W.R. Gregg
(8) Meteorological instruments.
C.F. Marvin
(9) Assembling and interpreting meteorological data.
R.H. Weightman
(10) Spectrum analysis, visible, infra-red and ultra-violet.
O.R. Wulf
(11) Measurement of light in relation to photosynthesis.
F.S. Brackett
(12) Equipment for growing plants under controlled conditions.
W.W. Garner
(13) Measuring and recording time intervals.
R.W. French
(14) Oscillograph and other electrical recording methods.
R.W. French
(15) Photo-electric cell; grid glow tubes; amplification.
R.W. French
(16) Nephelometer.
E.D. McAllister
(17) Spectrophotometer.
R.W. French
(18) The microscope in identification of organic and inorganic compounds.
W.H. Fry
(19) Photomicrography.
R.W. French
(20) Measurement of colloidal particles.
G.E. Holm
(21) Measurement of Brownian movement and Cataphoresis.
M.S. Anderson

(22) X-ray equipment and use.
S.B. Hendricks
(23) Supersonic phenomena.
L.B. Olmstead
(24) Micro-determinations.
E.P. Clark
(25) Hydrogen-ion determinations.
B.C. Brunstetter
(26) Measurement of rate of oxidation.
G.R. Greenbeck
(27) Methods and apparatus for gas analysis.
E.R. Weaver
(28) Methods of low temperature distillation.
E.W. Washburn
(29) Measurement of low pressures.
C.H. Kunsman

ADVANCED STATISTICAL METHODS (Second semester).--Mr. C.M. Purves, assisted by Mr. Alexander Sturgiss. Tuesday, 2 hours, beginning February 16. Room 411, Bieber Building.

The development and application of the theory of statistical analysis; a study of simple and multiple correlation, both linear and curvilinear, and their application and interpretation in research work. Attention will be given to the problems involved in time series analysis. All members of the class are expected to provide themselves with an appropriate problem in multiple correlation, preferably something from the field in which they are employed. Doctor Ezekiel's new book, Method of Correlation and Analysis, will be used with the class. Prerequisites, elementary work in statistics and algebra through simultaneous equations.

HISTORY OF AMERICAN AGRICULTURE (Second semester).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning February 9. Room 320, Bieber Building, 1358 B St., S. W. No prerequisites.

A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses and proposed solutions. This semester may be taken independent of the first semester.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (Second semester).--Mr. L.H. Bean. Tuesday and Friday, beginning February 26. Room 500, Crop Estimates, Corner 14th and B Streets, S. W.

This semester will deal with certain interrelations between business and agriculture, such as the place of agriculture in the various theories of

business cycles; the influences of agricultural production on industrial activity, of farm income on the market for industrial products, and of prices on agricultural and industrial production, speculation, and foreign trade; the influences of industrial conditions, employment, and the buying power of urban consumers on agricultural prices, farm expenditures, and not farm income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture; methods employed in forecasting agricultural production, prices, and income; and methods employed in forecasting business and demand conditions in agricultural outlook reports.

PLANT ANATOMY (Second semester).--Dr. Ernst Artschwager. Saturday, 1 o'clock, beginning Fenruary 6. Room 401, West Wing.

The course is intended primarily for students in applied fields of botany. It deals with the subject matter, literature, and problems of plant anatomy, and is designed to give the student a working acquaintance with the inner structure of vascular plants, with emphasis on interpretation. Those taking the course will be required to study prepared slides and fresh material and present the results of such studies in the form of drawings and written reports. Besides, each student will be required to make a complete anatomical ontogenetic study of a given plant in order to apply and test the knowledge gained in this course. The course is open to students who have the usual assortment of undergraduate study in botany. Eames and McDaniels Plant Anatomy will be used as text book.

INTRODUCTION TO ENZYME CHEMISTRY (One semester).--Dr. A.K. Balls. Wednesday, February 3, at which meeting arrangements will be made for regular 1 hour weekly meetings. Room 212, 216 - 13th Street, S. W.

A course dealing with the characteristics of several of the best-known enzyme systems, such as the proteinases, the carbohydrases, and the enzymes of oxidation. The aim is to introduce the hearer to the present-day theories regarding the nature and mode of action of enzymes, the kinetics of enzyme action, and the modes of separation, determination, and study developed by the Willstätter school. A knowledge of organic and biological chemistry is prerequisite.

ELEMENTARY MATHEMATICAL ECONOMICS (One semester).--Mr. Mordecai Ezekiel. Monday, 2 hours, beginning February 1. Room 500, Crop Estimates, corner 14th and B Streets, S. W.

A seminar in elementary mathematical economics covering a simple approach to economic theory, stated in clear-cut mathematical terms. It is strictly a seminar course, with members of the seminar responsible for doing most of the thinking and development of the material under guidance of the leader. As much attention is paid to the validity of the assumptions under existing economic conditions as to the theory itself. This field of economic theory is one of the most recent developments and one which is basic to much of the research work in economic statitstics and economic research. Prerequisites, at least one year's graduate work in economics and one year's work in statistics.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (Second semester).--Dr. Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning February 1. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course is a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

ELEMENTARY STATISTICAL METHODS (Second semester).--B.R. Stauber and F.J. Hosking. Monday and Thursday, beginning February 15. Room 411, Bieber Building.

The second semester is devoted entirely to the different phases of correlation, starting in with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and linear multiple correlation. The object of this semester is to enable the students to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ELEMENTARY STATISTICAL METHODS (First semester).--B.R. Stauber and F.J. Hosking. Wednesday and Friday, beginning February 10. Room 411, Bieber Building.

First half of the course is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, construction and significance of index numbers, and the analysis of time series data.

SYSTEMATIC BOTANY (Second semester).--Dr. S. F. Blake. Monday and Wednesday, beginning February 8. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The meetings will be devoted principally to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

INTRODUCTORY ENTOMOLOGY AND INSECT ECOLOGY (Second semester).--Dr. C.H. Popenoe. Tuesday and Thursday, beginning February 9. Room H-326, Building F.

Insect ecology. The relationships of insects to their habitats and biotic communities and to the natural phenomena of their associates therein. This course is intended to outline the effects of the complete environment, physical, climatological, and biotic, on the population of insects; the general life processes of insects, the results of changes in climate, plant associations, cultivation, and other animal competitors on these processes; the bases for biological and cultural control and how to determine, analyze, and organize them.

SCIENTIFIC FRENCH (Second semester).--Dr. H. B. Humphrey. Monday and Wednesday, beginning February 1. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's le Livre des Champs and L'Industrie, Jousier's Economic Rurale, Bonnier's French Grammar, and elementary reading.

INTERMEDIATE SCIENTIFIC GERMAN (Second semester).--Dr. Charles Drechsler.. Tuesday and Thursday, beginning February 25. Room 33, basement of East Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar. The review aims at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader, Joynes Wesselhoeft's German Lesson Grammar.

ELEMENTARY RUSSIAN (Second semester).--Dr. C.H. Leineweber. Tuesday and Thursday, beginning February 16. Room 223, East Wing.

Russian verbs (regular and irregular) and translations of scientific articles on agricultural subjects.

ADVANCED RUSSIAN (Combined with second semester of Elementary Russian).-- Dr. C.H. Leineweber. Tuesday and Thursday, beginning February 16. Room 223, East Wing.

Repetition of the Russian verb. Reading and translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested.

SPANISH (Second semester).--Dr. C.H. Leineweber. Monday and Friday, beginning February 15. Room 410, Bieber Building.

Irregular verbs in connection with the use of the subjunctive. Reading and translations.

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MISS LACY.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

January 27
1932

LECTURE
ON RUSSIAN AGRICULTURE
BY DR. MORDECAI EZEKIEL.

On February 10, at 3 o'clock, Dr. Mordecai Ezekiel will deliver a lecture in the Auditorium of the U. S. National Museum on the Organization of the New Russian Agriculture and the Methods of Teaching and Extension in Soviet Russia, including a discussion of the difference between the State Farms and the Collective Farms, and something about farm-management methods used in planning Russian agriculture today.

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Doctor Ezekiel, on a scholarship of the Guggenheim Foundation, spent a year in Europe, returning last September, and during that time traveled a month in Russia. He will speak, therefore, from personal experience and observation.

This is a free public lecture under the auspices of the Graduate School of the Department.

A. F. Woods
Director of Scientific Work.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASNINGTON

March 15
1932

LECTURE ON CHINESE AGRICULTURE
By PAUL O. NYHUS

A lecture on Some Economic Aspects of Chinese Agriculture will be given by Paul O. Nyhus, under the auspices of the Graduate School, in the auditorium of the National Museum March 18, beginning at 3 o'clock.

Mr. Nyhus was stationed in Shanghai as a representative of the Bureau of Agricultural Economics in the Orient for four and one-half years, making surveys and cabled reports on the competition with and the demand for various agricultural commodities entering into our foreign trade with China. In spite of primitive transportation facilities and conditions of travel he made personal observations and investigations in many different provinces, including Inner Mongolia, and the western provinces of Shensi, Szechwan, and Yunnan.

In this lecture Mr. Nyhus proposes to describe farming conditions in different regions of China, the peasant economy of the Chinese, efficiency as farmers, and possible improvements.

The lecture is free and open to any one who wishes to attend.

A. F. Woods
Director of Scientific Work.

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON
August 1
1932

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U.S. DEPARTMENT OF AGRICULTURE

In view of the reduction in salaries for the current fiscal year upon recommendation of the Committee of the Graduate School Council the fees will be reduced 10 per cent for this year. The fee for the first semester will therefore be $12.50 and for the second semester $9. This supersedes the statement on the first page of the announcement.

A. F. Woods
Director of Scientific Work.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

August 31
1932.

GRADUATE SCHOOL

PRELIMINARY ANNOUNCEMENT

The Graduate School of the United States Department of Agriculture will open its twelfth year beginning October 10. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. Tuition, payable in advance, is $25 for two semesters of 30 hours each or $15 for one semester.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested in the particular subjects to see if a sufficient number is interested so that the course may be self-supporting. Where a sufficient number is interested an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employes may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, Cornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph D., M. A., M. S., B. A., and B. S. degrees.

A file of the catalogues of universities and Land-grant Colleges and announcements of courses to be offered by the Bureau of Standards are filed in my office and are available there for consultation.

The University of Maryland announces a course in Advanced Inorganic Chemistry, by Dr. C. E. White, Associate Professor of Inorganic Chemistry of the University. The course will consist of lectures from 6:30 to 7:30 and Laboratory from 7:30 to 10:30, will begin October 3, and will be held in Room 107, Chemistry Building of the University. The course will be devoted chiefly to a study of the rarer elements and their compounds. The lecture part of the course (4 credits) may be taken without the laboratory (4 credits).

The American University will conduct courses in Economic Georgraphy of Agricultural Production, Problems and Research Methods in Farm Organization and Management, Agricultural Price-making Forces and Processes, Price Analysis and Price Forecasting, Rural Social Problems, Agricultural Products in International Trade, Analytical Methods in Agricultural Economic Research, Seminar in Agricultural Economics--Agricultural Depressions, and Seminar in Agricultural Economic Agricultural Reconstruction. These will be given mainly by members of the Bureau of Agricultural Economics. Tuition $40 for two semesters, or $10 per semester hour.

A list of the courses to be offered by the Graduate School will be found on the last page. Each person interested is requested to check the course or courses he expects to take, indicate any other course he desires, detach the sheet, and return it to me as soon as possible.

A. F. Woods
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

ECOLOGY (year).--M. B. Waite, assisted by various specialists. Monday and Thursday, beginning October 10. Room 318 West Wing.

First semester, PLANT ECOLOGY, GENERAL.--The general principles of plant ecology, including the soil, climatic, and other factors influencing the principal native plant formations of the United States and the principal crop-plant regions. While special attention will be devoted to the ecology of native flowering plants, the ecology of lower forms of plant life will be considered; the ecology of cultivated crop plants will be stressed; and the local plant formations around Washington, D. C., will be given some attention. The attempt will be made to develop the viewpoint of plant ecology, methods of study and observation, as bearing on problems in botany and phytotechny. Prerequisites, a general knowledge of botany and of agriculture.

Second semester, ECOLOGY OF PLANT DISEASES.--M. B. Waite. The attempt will be made to develop the principles of ecology as applied to plant diseases. The effect of the various ecological factors will be discussed in relation, first, to the nonparasitic diseases of plants, and second, to the virus and parasitic diseases of plants; and the ecology of insects concerned in transmitting disease will be considered. The ecology of special-type diseases and special groups of diseases, particularly diseases of fruits but also of other horticultural and agronomic crops, will be stressed. The problems of the incidence, distribution, and epidemics of parasitic and virus diseases, as well as the factors concerned in the nonparasitic or ecological diseases, will be discussed. Prerequisites, a general knowledge of botany, phytotechny, and plant pathology, and the above first semester.

ELECTROCHEMISTRY (year).--Dr. Malcolm M. Haring, Professor of Physical Chemistry, University of Maryland. Tuesday and Thursday, beginning October 11. Room 500 Administration Building.

A study of the principles and some of the practical applications: Ionic equilibria, electromotive force, conductivity, electrolysis, polarization, etc. First semester, theory; second semester, practical applications.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning October 11. Room 223-24, East Wing.

A development of the genetic principles that underlie plant breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modity germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).--Dr. W. B. Kemp. Monday, 2 hours, beginning October 10. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

SOILS AND FERTILIZERS (Year).

(First semester) COMPOSITION OF SOILS.--Dr. Horace G. Byers, and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning October 11. Room 101, East Wing.

The course will treat of the origin of soil and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics upon which particular stress will be laid are: Soil constitution, soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes which will be demonstrated will include mechanical analysis, petrographic methods, chemical analysis, base exchange methods, electrodialysis, cataphoresis, and hydrogen-ion determinations. Prerequisite for the course, graduation from an agricultural college or equivalent training in undergraduate work in chemistry and physics. The course is not prerequisite for the work of the Second Semester, but is excellent preparation for that work.

Second Semester, MANUFACTURE, THEORY, AND USE OF FERTILIZERS.--Dr. R. O. E. Davis and other members of the staff of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning after close of first semester. Room 101, East Wing.

While this course is a composite by a number of specialists, it will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, manufacture of fertilizers, methods of preparation, new developments in commercial fertilizer manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry. The following is a tentative list of proposed lectures to be given:

Development of Commercial Fertilizers	R. O. E. Davis
Phosphoric acid sources and superphosphates	K. D. Jacob
Furnace processes for producing phosphoric acid	P. H. Royster
Potash resources	J. W. Turrentine
Mineral and synthetic nitrogen sources	R. O. E. Davis
Bacterial fixation and relation to humus	Dean Burk
Mixed fertilizer (manf., composition, etc.)	A. R. Merz and W. H. Ross
Concentrated fertilizers (tech. processes, mixing, properties, etc.)	A. R. Merz and W. H. Ross
Fertilizer deficiencies and biological significance of fertilizer elements	O. Schreiner
Organic fertilizers and relation of organic matter to fertility	E. C. Shorey
Fertilizer experimentation in the field	J. J. Skinner
Testing fertilizers in the greenhouse	J. J. Skinner
Fertilizer applications and distribution	B. E. Brown
Lime and magnesia in fertilizer practice	B. E. Brown
Relation of fertilizers to soil reaction	E. F. Snyder
Fertilizer statistics and economics	P. E. Howard
Analytical methods	W. H. Ross

THERMODYNAMICS APPLIED TO CHEMICAL AND ENGINEERING PROBLEMS (year).--Dr. R. Wiebe. Monday and Wednesday, beginning October 10. Room 101 East Wing.

This course requires as a prerequisite a knowledge of physical chemistry and preferably of the theory of thermodynamics. It will involve the different methods of obtaining entropies, heats of reaction, and free energies both from theory and experiment; a discussion of the meaning of free energy, of how the course of a chemical reaction may be predicted, and of the limitations of such calculations; difference between true and conventional chemical constants and application of the approximate Nernst equation to the calculation of chemical equilibria; uses of the Clausius-Clapeyron equation, Poynting and other well known thermodynamic equations; meaning and application of partial molal quantities in chemical calculations; calculations of the efficiency of steam engines, refrigerating machines, and internal combustion engines, including the use of Mollier and related diagrams. Finally brief mention will be made of the thermodynamics of the thermocouple and of the atmosphere. The solving of numerous problems will be one of the main features of this course.

RECENT ADVANCES IN ENZYME CHEMISTRY (one semester)--Dr. A. K. Balls. Wednesday, October 12, at which meeting two days a week will be decided on for holding the class. Room 214, 216, 13th St. S. W.

This will be a seminar course. The aim is to study in detail a number of the recent important contributions to the literature of enzyme action. Students must possess a general knowledge of enzyme chemistry, equivalent to the introductory course of last semester, and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

ADVANCED STATISTICAL ANALYSIS (year).--Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning October 11. Room 2050, South Building.

First Semester.-- The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simple and multiple correlation, emphasising the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's "Introduction to the Theory of Statistics", Ezekiel's "Methods of Correlation Analysis", and R. A. Fisher's "Statistical Methods for Research Workers'" will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second Semester.--Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. In both semesters attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

PLANT ANATOMY (year).--Dr. Ernst Artschwager. Saturday, 1:30 o'clock, beginning October 15 (suitable hours will be arranged later with the class). Room 401, West Wing.

The course is intended primarily for students in applied fields of botany. It deals with the subject matter, literature, and problems of plant anatomy, and is designed to give the student a working acquaintance with the

inner structure of vascular plants, with emphasis on interpretation. Those taking the course will be required to study prepared slides and fresh material outside of class and present the results of such studies in the form of drawings and written reports. Besides, each student will be required to make a complete anatomical ontogenetic study of a given plant in order to apply and test the knowledge gained in this course. To facilitate this work there will be at the beginning of the term a practical demonstration in the most suitable fixing and staining technique and in taking photomicrographs. The course is open to students who have the usual assortment of undergraduate study in botany. Eames and McDaniels Plant Anatomy will be used as text book.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning October 10. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average research finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Monday and Wednesday, beginning October 10. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower will be studied. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

ADMINISTRATIVE AND BUSINESS LAW (second semester).--J. B. Horigan, A. M., LL.B. Tuesday and Friday, beginning January 17. Room 402 Administration Building.

The course will deal particularly with law as related to the functions of the Department of Agriculture. Fuller description will be given in the Final Announcement.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (year).--M. S. Eisenhower and Vernon E. Bundy. Tuesday and Thursday, beginning October 11. Room 302, Administration Building.

This course will be built around actual practice in writing interpretative articles on agriculture and home economics.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, and RELATED SUBJECTS (one semester).--Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning October 10. Room 500, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY STATISTICAL METHODS (year).--B. R. Stauber and F. J. Hosking. Monday and Wednesday, beginning October 10. Room 2050, second floor, South Building.

First semester.--This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Second semester.--This will be a continuation of the first semester. It will be devoted entirely to the different phases of correlation, starting with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ELEMENTARY STATISTICAL METHODS (second semester).--B. R. Stauber. Tuesday and Thursday, beginning October 11. Room 3065 South Building.

This semester will be a continuation of the one conducted during the spring of the last school year. It will be devoted entirely to the different phases of correlation, starting in with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

If there is sufficient demand a new course will be initiated for the spring semester, similar to the first semester course beginning October 11.

SCIENTIFIC FRENCH (year).--Dr. H. B. Humphrey. Monday and Wednesday, beginning October 10. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Jousier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning October 11. Room 213 West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and a Grammar to be designated later.

ELEMENTARY RUSSIAN (year).--Dr. C. H. Leineweber. Wednesday and Thursday (suitable dates will be arranged with the class), beginning October 12. Room 1448, South Building.

This course is especially designed to enable the student after mastering the elements of Russian grammar to make translations of scientific articles on agricultural subjects.

ADVANCED RUSSIAN (year).--Dr. C. H. Leineweber. Tuesday and Friday, beginning October 11. Room 1448, South Building.

Grammar and translations of Russian scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Prerequisite, two semesters of Russian grammar and reading.

INTRODUCTORY ENTOMOLOGY AND INSECT ECOLOGY (year).-- Dr. C. W. Popenoe. Tuesday and Thursday, beginning October 11. Room H-326, Building F.

First semester.--Economic entomology. This course will cover the economic position of the insects, basic principles of classification, with outline of the principal economic orders; general insect control, practices including cultural, insecticidal, and biological methods; fruit and truck insects, forest insects, greenhouse, household, and stored-product insects, and insects affecting man and domestic animals.

Second semester.--Insect ecology. The relationships of insects to their habitats and biotic communities and to the natural phenomena of their associates therein. This course is intended to outline the effects of the complete environment, physical, climatological, and biotic, on the population of insects; the general life processes of insects, the results of changes in climate, plant associations, cultivation, and other animal competitors on these processes; the bases for biological and cultural control and how to determine, analyze, and organize them.

Dr. A. F. Woods
Director of Scientific Work
and Graduate School.

Dear Doctor Woods:

I expect to take the course of courses checked in the following list:

GRADUATE COURSES

(1) Ecology
(2) Electrochemistry
(3) Plant Genetics
(4) Advanced course in Statistics for Biological Workers
(5) Soils and Fertilizers
(6) Thermodynamics Applied to Chemical Engineering Problems
(7) Recent Advances in Enzyme Chemistry
(8) Advanced Statistical Analysis
(9) Plant Anatomy

UNDERGRADUATE COURSES

(10) Glass Blowing
(11) Systematic Botany
(12) Administrative and Business Law
(13) Interpreting Agriculture and Home Economics
(14) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(15) Elementary Statistical Methods
(16) Elementary Statistical Methods (second semester)
(17) Scientific French
(18) Intermediate Scientific German
(19) Elementary Russian
(20) Advanced Russian
(21) Introductory Entomology and Insect Ecology.

If given I would also take a course in.....

.....

Name.....

Address.....

aq
298/E
OCT 5 1932

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

September 15
1932

LIBRARY
BUREAU OF
AGRICULTURAL ECONOMICS
U. S. DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

FINAL ANNOUNCEMENT

The Graduate School of the United States Department of Agriculture will open its twelfth year beginning October 10. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. Tuition, payable in advance. In view of the reduction in salaries for the current fiscal year, upon recommendation of the Committee of the Graduate School Council, the fees will be reduced for this year to $12.50 for the first semester and $9 for the second.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested in the particular subjects to see if a sufficient number is interested so that the courses may be self-supporting. Where a sufficient number is interested an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, Cornell, George Washington, American, John Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph.D., M. A., M. S., B.A., and B.S. degrees.

A file of the catalogues of universities and Land-grant Colleges and announcements of courses to be offered by the Bureau of Standards are filed in my office and are available there for consultation.

The University of Maryland announces a course in Advanced Inorganic Chemistry, by Dr. C. E. White, Associate Professor of Inorganic Chemistry of the University. The course will consist of lectures from 6:30 to 7:30 and Laboratory from 7:30 to 10:30, will begin October 3, and will be held in Room 107, Chemistry Building of the University. The course will be devoted chiefly to a study of the rarer elements and their compounds. The lecture part of the course (4 credits) may be taken without the laboratory (4 credits).

The American University will conduct courses in Economic Geography of Agricultural Production, Problems and Research Methods in Farm Organization and Management, Agricultural Price-making Forces and Processes, Price Analysis and Price Forecasting, Rural Social Problems, Agricultural Products in International Trade, Analytical Methods in Agricultural Economic Research, Seminar in Agricultural Economics--Agricultural Depressions, and Seminar in Agricultural Economic Agricultural Reconstruction. These will be given mainly by members of the Bureau of Agricultural Economics. Tuition $40 for two semesters, or $10 per semester hour.

A list of the courses to be offered by the Graduate School will be found on the last page. Each person interested is requested to check the course or courses he expects to take, indicate any other course he desires, detach the sheet, and return it to me as soon as possible.

A. F. Woods
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

ECOLOGY (year).--M. B. Waite, assisted by various specialists. Monday and Thursday, beginning October 10. Room 318 West Wing.

First semester, Plant Ecology, General.--The general principles of plant ecology, including the soil, climate, and other factors influencing the principal native plant formations of the United States and the principal crop-plant regions. While special attention will be devoted to the ecology of native flowering plants, the ecology of lower forms of plant life will be considered; the ecology of cultivated crop plants will be stressed; and the local plant formations around Washington, D.C., will be given some attention. The attempt will will be made to develop the viewpoint of plant ecology, methods of study and observation as bearing on problems in botany and phytotechny. Prerequisites, a general knowledge of botany and of agriculture.

Second semester, Ecology of Plant Diseases.--M. B. Waite. The attempt will be made to develop the principles of ecology as applied to plant diseases. The effect of the various ecological factors will be discussed in relation, first, to the nonparasitic diseases of plants, and second, to the virus and parasitic diseases of plants and the ecology of insects concerned in transmitting disease will be considered. The ecology of special-type diseases and special groups of diseases, particularly diseases of fruits but also of other horticultural and agronomic crops, will be stressed. The problems of the incidence, distribution, and epidemics of parasitic and virus diseases, as well as the factors concerned in the nonparasitic or ecological diseases, will be discussed. Prerequisites, a general knowledge of botany, phytotechny, and plant pathology, and the above first semester.

ELECTROCHEMISTRY (year).--Dr. Malcolm M. Haring, Professor of Physical Chemistry, University of Maryland. Tuesday and Thursday, beginning October 11. Room 500 Administration Building.

A study of the principles and some of the practical applications; Ionic equilibria, electromotive force, conductivity, electrolysis, polarization, etc. First semester, theory; second semester, practical applications.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning October 11. Room 223-24, East Wing.

A development of the genetic principles that underlie plant-breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modify germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).--Dr. W. B. Kemp. Monday, 2 hours, beginning October 10. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation

methods, and analysis of variance as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

SOILS AND FERTILIZERS (Year).

First semester, Composition of Soils.--Dr. Horace G. Byers and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning October 11. Room 101, East Wing.

The course will treat of the origin of soils, and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics upon which particular stress will be laid are: Soil constitution, soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes which will be demonstrated will include mechanical analysis, petrographic methods, chemical analysis, base exchange methods, electrodialysis, cataphoresis, and hydrogen-ion determinations. Prerequisite for the course, graduation from an agricultural college or equivalent training in undergraduate work in chemistry and physics. The course is not prerequisite for the work of the Second Semester, but is excellent preparation for that work.

Second semester, Manufacture, Theory, and Use of Fertilizers.--Dr. R. O. E. Davis and other members of the staff of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning after close of first semester. Room 101, East Wing.

While this course is a composite by a number of specialists, it will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, manufacture of fertilizers, methods of preparation, new developments in commercial fertilizer manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry. The following is a tentative list of proposed lectures to be given:

Development of Commercial Fertilizers	R.O.E. Davis
Phosphoric acid sources and superphosphates	K.D. Jacob
Furnace processes for producing phosphoric acid	P.H. Royster
Potash resources	J.W. Turrentine
Mineral and synthetic nitrogen sources	R.O.E. Davis
Bacterial fixation and relation to humus	Dean Burk
Mixed fertilizer (manf., composition, etc.)	A.R. Merz and W.H. Ross
Concentrated fertilizers (tech. processes, mixing, properties, etc.)	A.R. Merz and W.H. Ross
Fertilizer deficiencies and biological significance of fertilizer elements	O. Schreiner
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Fertilizer experimentation in the field	J.J. Skinner
Testing fertilizers in the greenhouse	J.J. Skinner

Fertilizer applications and distribution	B.E. Brown
Lime and magnesia in fertilizer practice	B.E. Brown
Relation of fertilizers to soil reaction	E.F. Snyder
Fertilizer statistics and economics	P.E. Howard
Analytical methods	W.H. Ross

THERMODYNAMICS APPLIED TO CHEMICAL AND ENGINEERING PROBLEMS (year).--Dr. R. Wiebe. Monday and Wednesday, beginning October 10. Room 101 East Wing.

This course requires as a prerequisite a knowledge of physical chemistry and preferably of the theory of thermodynamics. It will involve the different methods of obtaining entropies, heats of reaction, and free energies both from theory and experiment; a discussion of the meaning of free energy, of how the course of a chemical reaction may be predicted, and of the limitations of such calculations; difference between true and conventional chemical constants and application of the approximate Nernst equation to the calculation of chemical equilibria; uses of the Clausius-Clapeyron equation, Poynting, and other well known thermodynamic equations; meaning and application of partial molal quantities in chemical calculations; calculations of the efficiency of steam engines, refrigerating machines, and internal combustion engines, including the use of Mollier and related diagrams. Finally brief mention will be made of the thermodynamics of the thermocouple and of the atmosphere. The solving of numerous problems will be one of the main features of this course.

RECENT ADVANCES IN ENZYME CHEMISTRY (one semester) --Dr. A.K. Balls. Wednesday, October 12, at which meeting two days a week will be decided on for holding the class. Room 214, 216, 13th St. S.W.

This will be a seminar course. The aim is to study in detail a number of the recent important contributions to the literature of enzyme action. Students must possess a general knowledge of enzyme chemistry, equivalent to the introductory course of last semester, and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

ADVANCED STATISTICAL ANALYSIS (year).--Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning October 11. Room 2050, South Building.

First semester.--The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simple and multiple correlation, emphasising the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's Introduction to the Theory of Statistics, Ezekiel's Methods of Correlation Analysis, and R. A. Fisher's Statistical Methods for Research Workers' will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second semester.--Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some

time will be spent on the more advanced methods of time series analysis. In both semesters attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

PLANT ANATOMY (Second semester).--Dr. Ernst Artschwager. Saturday, 1:30 o'clock, beginning January 14, 1933 (suitable hours will be arranged later with the class). Room 401, West Wing.

A study of the normal and pathological anatomy of important economic plants.

MYCOLOGY--COMPARATIVE MORPHOLOGY AND TAXONOMY OF THE FUNGI (year).--Dr. William W. Diehl. Monday and Wednesday, beginning October 10 (suitable dates will be arranged with class). Room 334 West Wing.

This course, chiefly by means of laboratory study of selected types, will attempt to present the principal morphological bases for classification of the more important orders of the fungi, and through practice with the technical literature to attain some proficiency in the identification of specimens.

First semester.--Myxomycetes, Phycomycetes, and Discomycetes.

Second semester.--Pyrenomycetes, Basidiomycetes, and Fungi Imperfecti.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning October 10. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repitition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (year).--Dr. S.F. Blake. Monday and Wednesday, beginning October 10. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower will be studied. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

ADMINISTRATIVE AND BUSINESS LAW (second semester).--J.B. Horigan, A.M. LL.B. Tuesday and Friday, beginning January 17. Room 402 Administration Building.

The course will deal particularly with law as related to the functions of the Department of Agriculture. In broad outline, the subject matter to be covered by these lectures, ten or twelve in number, will be as follows:

(1) The constitutional and statutory basis of Executive Departments and their subdivisions.
(2) The Organic Act and other statutes defining the functions and duties of the Department of Agriculture.
(3) The regulatory statutes administered by the Department.
(4) The legal force and effect of Departmental Regulations.
(5) The principles of statutory construction.
(6) The legal activities of the Department in relationship to private rights.
(7) Federal and State relationships affected by this Department's activities.
(8) Government contracts.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (year).--M.S. Eisenhower and Vernon E. Bundy. Tuesday and Thursday, beginning October 11. Room 302, Administration Building.

This course will be built around actual practice in writing interpretative articles on agriculture and home economics.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester).--Dr. M.C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning October 10. Room 500, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY STATISTICAL METHODS (year).--B.R. Stauber and F.J. Hosking. Monday and Wednesday, beginning October 10. Room 2050, second floor, South Building.

First semester.--This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Second semester.--This will be a continuation of the first semester. It will be devoted entirely to the different phases of correlation, starting with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ELEMENTARY STATISTICAL METHODS (second semester).--B.R. Stauber. Tuesday and Thursday, beginning October 11. Room 3065 South Building.

This semester will be a continuation of the one conducted during the spring of the last school year. It will be devoted entirely to the different phases of correlation, starting in with simple correlation of data applying to a given period of time and advancing to simple curvilinear correla-

tion, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

If there is sufficient demand a new course will be initiated for the spring semester, similar to the first semester course beginning October 11.

SCIENTIFIC FRENCH (year).—Dr. H.B. Humphrey. Monday and Wednesday, beginning October 10. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Jousier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning October 11. Room 213 West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kipf's Scientific German Reader and a Grammar to be designated later.

ELEMENTARY RUSSIAN (year).—Dr. C.H. Leineweber. Wednesday and Thursday (suitable dates will be arranged with the class), beginning October 12. Room 1448, South Building.

This course is especially designed to enable the student after mastering the elements of Russian grammar to make translations of scientific articles on agricultural subjects.

ADVANCED RUSSIAN (year).--Dr. C.H. Leineweber. Tuesday and Friday, beginning October 11. Room 1448, South Building.

Grammar and translations of Russian scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Prerequisite, two semesters of Russian grammar and reading.

Dr. A. F. Woods
Director of Scientific Work
and Graduate School.

Dear Doctor Woods:

I expect to take the course or courses checked in the following list:

GRADUATE COURSES

(1) Ecology
(2) Electrochemistry
(3) Plant Genetics
(4) Advanced course in Statistics for Biological Workers
(5) Soils and Fertilizers
(6) Thermodynamics Applied to Chemical Engineering Problems
(7) Recent Advances in Enzyme Chemistry
(8) Advanced Statistical Analysis
(9) Plant Anatomy
(10) Mycology

UNDERGRADUATE COURSES

(11) Glass Blowing
(12) Systematic Botany
(13) Administrative and Business Law
(14) Interpreting Agriculture and Home Economics
(15) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(16) Elementary Statistical Methods
(17) Elementary Statistical Methods (second semester)
(18) Scientific French
(19) Intermediate Scientific German
(20) Elementary Russian
(21) Advanced Russian

If given I would also take a course in.....

.....

Name.....

Address.....

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON
October 1
1932

MEMORANDUM
FOR CHIEFS OF BUREAUS

There is some demand for a course in Organic Chemistry and it will be given in case a sufficient number of students enroll. The class will be conducted by Dr. C. P. Clark, of the Bureau of Chemistry and Soils. It will meet in Room 223-24 of the East Wing Wednesday, October 12, at which time suitable dates for subsequent meetings will be fixed.

The course is designed for those who have a good foundation in general chemistry and desire an introduction in the original field. It will consist of a series of lectures.

Will you please have these notices distributed among your people and placed on the bulletin boards.

A. F. Woods
Director of Scientific Work
and Graduate School.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

October 15
1932

MEMORANDUM
FOR CHIEFS OF BUREAUS

There is some demand for a course in Comparative Nematology and arrangements have been made with Dr. B. G. Chitwood to conduct this course. The class will be held on Wednesday and Friday, beginning October 19, in Room 217-18 East Wing, and will be limited to 12 students.

The course is designed to give a basis for research in nematology. The first semester will be devoted to the morphology and histology of nematodes, with particular reference to the significance of such information in evolution and classification. Prerequisites, 4 college courses in zoology or the equivalent. The second semester will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the first semester. Each student will be given material to study at his convenience, and the laboratory work will coordinate with the lectures.

Each student must have a microscope at his disposal.

A. F. Woods
Director of Scientific Work
and Graduate School.

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

January 15
1933

G R A D U A T E S C H O O L

S E C O N D S E M E S T E R

The Graduate School of the United States Department of Agriculture opened its twelfth year beginning October 10. Classes meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. Tuition, payable in advance. In view of the reduction in salaries for the current fiscal year, upon recommendation of the Committee of the Graduate School Council, the fees are reduced for this year to $12.50 for one semester and $9 for the second.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested in the particular subjects to see if a sufficient number is interested so that the courses may be self-supporting. Where a sufficient number is interested an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School:

"In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree."

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, Cornell, George Washington, American, JohnsHopkins, Yale, Chicago, and Harvard, and received credit toward the Ph D., M. A., M. S., B.A., and B.S. degrees.

A file of the catalogues of universities and Land-grant Colleges and announcements of courses to be offered by the Bureau of Standards are filed in my office and are available there for consultation.

The University of Maryland announces a course in Advanced Inorganic Chemistry, by Dr. C. E. White, Associate Professor of Inorganic Chemistry of the University. The course consists of lectures from 6:30 to 7:30 and Laboratory from 7:30 to 10:30. It began October 3, and is held in Room 107, Chemistry Building of the University. The course is devoted chiefly to a study of the rarer elements and their compounds. The lecture part of the course (4 credits) may be taken without the laboratory (4 credits).

The American University will conduct courses in Economic Geography of Agricultural Production, Problems and Research Methods in Farm Organization and Management, Agricultural Price-making Forces and Processes, Price Analysis and Price Forecasting, Rural Social Problems, Agricultural Products in International Trade, Analytical Methods in Agricultural Economic Research, Seminar in Agricultural Economics--Agricultural Depressions, and Seminar in Agricultural Economic Agricultural Reconstruction. These are given mainly by members of the Bureau of Agricultural Economics. Tuition $40 for two semesters, or $10 per semester hour.

A. F. Woods,
Director of Scientific Work
and Graduate School.

GRADUATE COURSES

ECOLOGY (second semester).--M. B. Waite, assisted by various specialists. Monday and Thursday, beginning January 26. Room 318 West Wing.

Second semester, Ecology of Plant Diseases.--M. B. Waite. The attempt will be made to develop the principles of ecology as applied to plant diseases. The effect of the various ecological factors will be discussed in relation, first, to the nonparasitic diseases of plants, and second, to the virus and parasitic diseases of plants, and the ecology of insects concerned in transmitting disease will be considered. The ecology of special-type diseases and special groups of diseases, particularly diseases of fruits, but also of other horticultural and agronomic crops, will be stressed. The problems of the incidence, distribution, and epidemics of parasitic and virus diseases, as well as the factors concerned in the non-parasitic or ecological diseases, will be discussed. Prerequisites, a general knowledge of botany, phytotechny, and plant pathology, and the above first semester, or equivalent.

ELECTROCHEMISTRY (second semester).--Dr. Malcolm M. Haring, Professor of Physical Chemistry, University of Maryland. Tuesday and Thursday, beginning February 2. Room 500 Administration Building.

A study of the principles and some of the practical applications; Ionic equilibria, electromotive force, conductivity, electrolysis, polarization, etc. First semester, theory; second semester, practical applications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (second semester).--Dr. W. B. Kemp. Monday, 2 hours, beginning February 6. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text, R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

MANUFACTURE, THEORY, AND USE OF FERTILIZERS (second semester).--Dr. R. O. E. Davis and other members of the staff of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning February 7. Room 101, East Wing.

While this course is a composite by a number of specialists, it will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, manufacture of fertilizers, methods of preparation, new developments in commercial fertilizer manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry. The following is a tentative list of proposed lectures to be given:

Development of Commercial Fertilizers	R.O.E. Davis
Phosphoric acid sources and superphosphates	K.D. Jacob
Furnace processes for producing phosphoric acid	P. H. Royster
Potash resources	J.W. Turrentine
Mineral and synthetic nitrogen sources	R.O.E. Davis
Bacterial fixation and relation to humus	Dean Burk
Mixed fertilizer (manf., composition, etc.)	W.H. Ross
Concentrated fertilizers (tech. processes, mixing, properties, etc.)	A.R.Merz
Fertilizer deficiencies and biological significance of fertilizer elements	O. Schreiner
Organic fertilizers and relation of organic matter to fertility	E.C. Shorey
Fertilizer applications and distribution	B.E. Brown
Lime and magnesia in fertilizer practice	B.E. Brown
Relation of fertilizers to soil reaction	E.F. Snyder
Fertilizer statistics and economics	P.E. Howard
Analytical methods	W.H. Ross

RECENT ADVANCES IN ENZYME CHEMISTRY (second semester).--Dr. A.K. Balls, beginning Thursday, February 2. Room 214, 216, 13th St., S.W.

This will be a seminar course. The aim is to study in detail a number of the recent important contributions to the literature of enzyme action. Students must possess a general knowledge of enzyme chemistry, equivalent to the introductory course of last year, and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

ADVANCED STATISTICAL ANALYSIS (second semester).--Mr. C.H. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning January 31. Room 2050, South Building.

Second semester.--Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

MYCOLOGY--COMPARATIVE MORPHOLOGY AND TAXONOMY OF THE FUNGI (second semester).--Dr. William W. Diehl. Monday and Saturday, beginning February 6. Room 334 West Wing Monday. Room 501 Administration Building Saturday.

This course, chiefly by means of laboratory study of selected types, will attempt to present the principal morphological bases for classification of the more important orders of the fungi, and through practice with the technical literature to attain some proficiency in the identification of specimens.

Second semester.--Pyrenomycetes, Basidiomycetes, and Fungi Imperfecti.

MOLDS OF THE BACTERIOLOGICAL LABORATORY (one semester).--Dr. Charles Thom, February 1 (dates for meeting will be arranged with class). Room 244 West Wing.

Continuation of "mycology primarily for bacteriologists," given 1931-2. Each student will be furnished with a series of cultures illustrative of sections, genera, and species covered by the Key developed in the previous course. Outline for laboratory and guides to the literature both taxonomic and industrial, will be furnished. The student will be expected to use the facilities of his own laboratory in making first hand acquaintance with the molds supplied.

ANATOMY OF PLANTS (first semester).--Dr. Ernst Artschwager. First meeting Friday, January 20, at 4:40, at which time regular dates of meetings will be fixed. Room 401, West Wing.

A laboratory course, designed chiefly to give practice in identification and interpretation of normal and diseased plant tissues. There will be a brief review of laboratory technique and practice in taking photo-micographs.

ORGANIC CHEMISTRY (second semester).--Dr. E. P. Clark. Wednesday and Friday, beginning February 1. Room 223-24 East Wing.

The course is a continuation of a series of lectures upon elementary organic chemistry. The material to be covered will consist of a discussion of aromatic and heterocyclic compounds.

COMPARATIVE NEMATOLOGY (second semester).--Dr. B. G. Chitwood. Wednesday and Friday, beginning February 1. Room 217-18 East Wing. The class will be limited to 12 students.

The course is designed to give a basis for research in nematology. The first semester was devoted to the morphology and histology of nematodes, with particular reference to the significance of such information in evolution and classification. Prerequisites, 4 college courses in zoology or the equivalent. The second semester will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the first semester. Each student will be given material to study at his convenience, and the laboratory work will coordinate with the lectures. Each student must have a microscope at his disposal.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (second semester).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning January 30. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (second semester).--Dr. S.F. Blake. Monday and Wednesday, beginning February 6. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester was devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower were studied. The principles of botanical nomenclature were discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

INTRODUCTORY ENTOMOLOGY (first semester).--Dr. P. N. Annand. Tuesday and Thursday, beginning 4:35 p.m. Room H-326, Building F.

An introduction to the study of insects. This course is intended for students without previous entomological training. It consists of a study of elementary insect morphology, insect metamorphosis, classification, and methods of control. A general review of entomological problems and methods is given by means of illustrative examples taken from actual field and laboratory studies of insect biology and control.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (second semester).--M. S. Eisenhower and Vernon E. Bundy. Tuesday and Thursday, beginning Thursday, February 2. Room 302, Administration Building.

This course is built around actual practice in writing interpretative articles on agriculture and home economics. Each student is required to prepare interpretative articles on subjects of his own selection. These are used as a basis for class discussion. The main purpose

is to aid each student to select significant subjects for articles, to organize the material properly, to present the interpretative material in a way that it will appeal to the readers of specific journals, and finally to edit the articles for readability, effectiveness, and literary style. The enrollment for this course is limited to 15 students to permit the instructors to give individual attention to the writings of each student. However, a minimum of 8 is required.

ELEMENTARY STATISTICAL METHODS (second semester).--B. R. Stauber and F. J. Hosking. Monday and Wednesday, beginning February 1. Room 2050, second floor, South Building.

Second semester.--This will be a continuation of the first semester. It will be devoted entirely to the different phases of correlation, starting with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

PRINCIPLES OF PHOTOGRAPHY (first semester).--Dr. B. H. Carroll. Monday and Wednesday, beginning February 15. Room 500, Administration Building.

This course is planned for those using photography as a scientific or technical implement. An acquaintance with the rudiments of photographic processes is desirable.

General principles:

- Tone reproduction by photography, including representation of colored objects in monochrome.
- Characteristics of sensitive materials and choice of materials for a given subject.
- Cameras, lenses, auxiliary apparatus, and dark-room equipment.
- Exposure and lighting.
- Development, fixing, washing, and after treatments.
- Printing, including enlargements, lantern slides, etc.

Special topics:

- Photomicrography, including low-power work with camera lenses.
- Color photography,
- Motion pictures.
- Photomechanical processes.
- Pictorial principles.

Other topics may be added according to the interests of the class. Because of the difficulty of arranging formal laboratory instruction those registering for the course must have camera and dark rooms available, with the usual materials and equipment.

ADMINISTRATIVE AND BUSINESS LAW (second semester).--J. P. Wenchel, LL.B. Tuesday and Friday, beginning February 17. Room 412 Administration Building.

The course will deal particularly with law as related to the functions of the Department of Agriculture. In broad outline, the subject matter to be covered by these lectures, ten or twelve in number, will be as follows:

(1) The constitutional and statutory basis of Executive Departments and their subdivisions.
(2) The Organic Act and other statutes defining the functions and duties of the Department of Agriculture.
(3) The regulatory statutes administered by the Department.
(4) The legal force and effect of Departmental Regulations.
(5) The principles of statutory construction.
(6) The legal activities of the Department in relationship to private rights.
(7) Federal and State relationships affected by this Department's activities.
(8) Government contracts.

SCIENCE FRENCH (second semester).--Dr. H. B. Humphrey. Monday and Wednesday, beginning February 6. Room 105, West Wing.

Reading, reviewing, and abstracting of French publications on agricultural botany, farm crops, industries, industrial chemistry, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's le Livre des Champs and l'Industrie; Moffatt's French Grammar.

INTERMEDIATE SCIENTIFIC GERMAN (second semester).--Dr. Charles Drechsler. Tuesday and Thursday, beginning February 7. Room 223 East Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar.

ELEMENTARY RUSSIAN (second semester).--Dr. C. H. Leineweber. Wednesday and Friday, beginning February 3. Room 1448, South Building.

This course is especially designed to enable the student after mastering the elements of Russian grammar to make translations of scientific articles on agricultural subjects.

ADVANCED RUSSIAN (second semester).--Dr. C. H. Leineweber. Tuesday and Thursday, beginning February 2. Room 1448, South Building.

Grammar and translations of Russian scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Prerequisite, two semesters of Russian grammar and reading.

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U. S. DEPARTMENT OF AGRICULTURE

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

August 15
1933

G R A D U A T E S C H O O L

P R E L I M I N A R Y A N N O U N C E M E N T

The Graduate School of the United States Department of Agriculture will open the 1933-34 school year the week beginning September 25. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. The tuition is $21.50 for two semesters, or $12.50 for the first semester and $9 for the second, and is payable in advance.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested to see if there is enough to make it self-supporting. In cases where there is a sufficient number, an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School: "In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree.

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, C ornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph. D., M. A., M. S., B. A., and B. S. degrees.

Catalogues of universities and land-grant colleges are kept in my office available for consultation.

Dr. Malcolm M. Haring, University of Maryland, will give a course at the University in colloid chemistry, with special reference to the needs of students of our Graduate School. The description of the course follows:

"Chem. 212 f. Credits (2), with laboratory (4). This is a thorough course in the chemistry of matter associated with surface energy. The first semester stresses the theoretical aspects of the subject.

"Chem. 212 s. Credits (2), with laboratory (4). This is a continuation of Chem. 212 f. The second semester's work deals with some of the practical applications of the principles studied previously.

"Lectures will be given Monday and Wednesday evening at 6:30 in Room DD-107, Chemistry Building, University of Maryland. The course will start Monday, September 25, and continue throughout the year. Laboratory periods will follow the lecture periods, i. e., at 7:30, in Room DD-211, and will be of 3 hours duration. Tuition for the course will be $10 per credit hour."

A list of the courses to be offered will be found on the last page. Please check the course or courses you expect to take, detach the sheet, and <u>return it to me promptly</u>, as it is especially desirable this year that we know in advance how many will enroll for each class.

As times are now heading toward normal this will probably be the last year tuition will be reduced.

Yours very truly,

A. F. Woods,
Director of Scientific Work,
Chairman of Graduate School.

GRADUATE COURSES

CONTROL OF PLANT DISEASES (year).--Dr. M. B. Waite and various associates in the Bureau of Plant Industry. Monday, Wednesday, and Friday, beginning September 27. Room 318, West Wing.

The present status of successful control of all types of diseases on all hosts, arranged mainly on a crop basis. Without minimizing the importance of the use of fungicides, particular attention will be paid to methods other than spraying and dusting, including the newer and unusual methods of plant disease prevention and control. While not intended as a complete course in plant pathology, which requires laboratory work, the lectures will include sufficient general information in plant pathology to enable the student to understand the theory of successful treatments. There will be discussions of the causes of environmental and physiological diseases, the behavior and infection methods of virus diseases, and of the life history, character of the organisms, infection methods, and epidemiology of the parasitic diseases. Information not yet in books and bulletins will be given, and publications freely cited for reading and reference during the course.

ADVANCED GENERAL CHEMISTRY (Based on the Periodic System) (year).--Horace G. Byers. Monday and Wednesday, beginning September 25. Room 101, East Wing.

The course will consist of an historical development of the fundamental laws and theories of chemistry, which ultimately made possible the development of the periodic system. This system will then be made the basis for the organization of the general chemical relationships shown by the elements which have led to the development of the modern laws and theories. Especial stress will be laid upon the question of atomic structure. The work will consist of lectures, which are to be supplemented by library research by the students. The results of the library work will be reported in papers which may be presented in class. Since the organization of the details of the course will depend largely on the number of students, it will be essential that all registrations be in well in advance of the first meeting of the class

SOILS AND FERTILIZERS (year).

First semester.--Composition of Soils. Dr. Horace G. Byers and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning September 26. Room 101, East Wing.

The course will discuss the origin of soils and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics stressed will be: Soil Constitution, soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes demonstrated will include mechanical analysis, base exchange methods, electro-dialysis, cataphoresis, and hydrogen-ion determinations. Prerequisites for the course: Graduation from an agricultural college or equivalent under-graduate work in chemistry and physics.

Second semester.--Manufacture, Theory and Use of Fertilizers, R. O. E. Davis and other members of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning after close of first semester.

This course by a number of specialists will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to the maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, methods of preparation, new developments in commercial manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning September 26. Room 223-24, East Wing.

A development of the genetic principles that underlie plant-breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modity germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year). -- Dr. W. B. Kemp. Monday, 2 hours, beginning September 25. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

RECENT ADVANCES IN ENZYME CHEMISTRY (one semester) --Dr. A.K. Balls. Wednesday, September 27, at which meeting two days a week will be decided on for holding the class. Room 214, 216 13th St. S.W.

This will be a seminar course. The aim is to study in detail a number of the recent important contributions to the literature of enzyme action. Students must possess a general knowledge of enzyme chemistry, equivalent to the introductory course of last semester, and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

PRINCIPLES OF ANIMAL PATHOLOGY (year).-- Dr. Robert J. Formad. Wednesday and Thursday, beginning September 27. Room 223-24.

Fundamental principles of structure and metabolism of cells and tissues; the relationship of body fluids to the tissues; disturbances of circulation; disturbances of nutrition and metabolism; defense of the body against injuries; inflammatory processes; injuries, reaction and attempted repair; outline of neoplasms; special pathology and consideration of the fundamental processes in the essential organs. Prerequisite animal histology.

Lectures will be supplemented as far as possible by microscopic study of slides illustrating the tissue changes.

AN INTRODUCTION TO ORGANIC CHEMISTRY (year).-- Dr. E. P. Clark. Monday and Thursday, beginning September 25. Room 509, 216 13th Street, S. W.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development

of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

ADVANCED ORGANIC CHEMISTRY (year) --Dr. H. L. Haller. Tuesday and Thursday, classes to be held at 8 a.m. Room 213 in 216 13th St., S.W. Beginning September 26.

The course will be devoted to a more advanced study of the compounds of carbon. Topics to be covered are the carbohydrates, proteins, fats, terpens, alkaloids, dyes, drugs, plant pigments, stereochemistry, etc. The subject matter will be varied to suit the needs of the particular group enrolled. An elementary course in organic chemistry or its equivalent is a prerequisite.

PHYSIOLOGICAL CHEMISTRY (year).--Paul E. Howe. Tuesday and Thursday, beginning September 26. Room H-337, Bldg. F.

First Semester.- A course on the elementary principles of physiological chemistry will be developed with reference to the needs of the class. It will deal with the characteristics of food stuffs, the processes involved in their conversion and assimilation by the body, the characteristics of body fluids and secretions, the products of excretion and characteristics of body tissues and the process of metabolism.

Second Semester.- The course will deal with selected topics relating expecially to body fluids, tissues, excretions and secretions, with the consideration of physiological activity in relation to biochemical processes in chemistry. A consideration of the endocrine glands on metabolic activity.

TAXONOMIC MYCOLOGY (year).--William W. Diehl. Tuesday, September 26 (two laboratory periods of two hours, each, time to be arranged) Room 334, West Wing.

This course is planned for those persons previously equipped with a general knowledge of fungus morphology who desire an intimate acquaintance with methods and the technical literature of taxonomic mycology. Chief consideration will be given to a study and identification of specimens gathered by members of the class.

COMPARATIVE NEMATOLOGY (year).--Dr. B. G. Chitwood. Wednesday and Friday, beginning September 27. Room 217-218 East Wing.

First Semester.- Will be devoted to the morphology and histology of nematodes, with particular reference to the significance of such information in evolution and classification. Prerequisites, 4 college courses in zoology or the equivalent.

Second Semester.- Will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the first semester. Each student will be given material to study at his convenience, and the laboratory work will coordinate with the lectures. Each student must have a microscope at his disposal.

Informal laboratories equivalent to 2 hours per week will be included, and in addition considerable work in the way of collecting and identification will be required.

ADVANCED STATISTICAL ANALYSIS (year).-- Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning September 25. Room 2050, South Building.

First semester.--The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simple and multiple correlation, emphasizing the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's Introduction to the Theory of Statistics, Ezekiel's Methods of Correlation Analysis, and R. A. Fisher's Statistical Methods for Research Workers' will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second semester.-- Emphasis will be placed on the fundamental methematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

ADJUSTMENT OF OBSERVATIONS -- Dr. W. Edwards Deming. Friday, September 29, when two weekly dates will be arranged. Room 2050 for first class.

First semester.- This course will treat the theory of errors from the fundamentals of simple statistics. It will begin with a review of the mathematics for the course. After some work in the calculation of moments of areas and in simple probability, the distribution of statistics of samples from a normal universe will be studied. This will be followed by the inverse argument of estimating the constants of the universe from which a sample has been drawn. It will be shown that this is precisely the problem that arises whenever observational data are collected for the purpose of estimating the value of some quantity. The five fiducial tests for hypotheses respecting the parent population will be analyzed. Bayes' theorem, Laplace's generalization of it, and the posterior method of estimation will be applied to the interpretation of data, and will be compared with the fiducial tests. The existence curves of Molina and Wilkinson will be used in several examples. No text will be used, but papers by Helmert, "Student", R. A. Fisher, Karl Pearson, Neyman, Egon Pearson, Shewhart, Keynes, Molina, and Wilkinson will be consulted.

Second semester.- The subject of least squares and empirical curves will be treated from the general and simplifying view point made possible by recent developments in the subject. By this method, observations on unrelated quantities, those connected by rigorous conditions, and those related by an empirical formula will be found amenable to a single simple scheme of adjustment. Comparisons will be made between the logic and labor of various methods for estimating the parameters of an empirical formula. Short cuts and checks in computation will be explained. Change in functional forms to produce linearity will be treated, and this will lead to the evaluation of derivatives from observational data. Some attention will be given to Karl Pearson's Chi - test for goodness of fit. Prerequisite: calculus.

PLANT GEOGRAPHY (second semester).--C. O. Erlanson. Wednesday and Friday. Room H-150, Building F.

A lecture course designed to clarify in the student's mind the components of the broad subject of plant geography. The historical development of the science, the various schools of thought and individual major

problems will be discussed. The vegetation of the various parts of the world will be described in general, and certain of the more important economic plants will be taken up in detail. Prerequisites: Elementary and Systematic Botany.

HISTORY OF AMERICAN AGRICULTURE (year).-- Everett E. Edwards. Tuesday and Thursday, beginning September 26. Room 1040 South Building.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic coast; indigenous and foreign contributions to American agriculture - Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, Franch influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.-- A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (year).--Mr. L. H. Bean, Tuesday and Friday, beginning September 26. Place of meeting will be announced in Final announcement.

First semester.- The first semester will cover (1) a review of the theories of business cycles, (2) a review of recent statistical contributions to the theory and characteristics of business cycles, (3) an examination of methods currently employed in measuring business cycles, and (4) a review of measures adopted during 1929-1933 to initiate business revival.

Second semester.- This semester will deal with certain interrelations between business and agriculture, such as the place of agriculture in the various theories of business cycles; the influences of agricultural production on industrial activity, of farm income on the market for industrial products, and of prices on agricultural and industrial production, speculation, and foreign trade; the influences of industrial conditions, employment, and the buying power of urban consumers on agricultural prices, farm expenditures, and net farm income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture; agricultural depressions, past and present; the place of agriculture in the effort toward business revival in 1933.

SOIL GENESIS, CLASSIFICATION, AND MAPPING. (one semester).-- Dr. Curtis F. Marbut. Monday, Wednesday and Friday, beginning December 4. Room 7311, Building F.

The purpose of this course is to explain the new concept of the soils, including the basis and principles of soil classification of the United States and of the World. This course will include the latest methods to be adopted in Land Classification. The latter subject is much in evidence because of the agricultural crisis now existing.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester).--Tuesday and Thursday, beginning Feb. 6. Room 110.

A composite course of thirty lectures by workers in this Department, the Bureau of Standards, and other laboratories, one or more lectures to be given by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Most of the meetings of the class will necessarily be held in laboratories where the special apparatus is installed. A list of the subjects and lecturers will be given in the Final Announcement.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning September 25. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repitition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (year).--Dr. S.F. Blake. Monday and Wednesday, beginning September 25. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower will be studied. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (year).--M. S. Eisenhower and staff. Tuesday and Thursday, beginning September 26. Room 302, Administration Building.

Students will be required to prepare interpretive articles for magazines and newspapers, as well as interpretive addresses for radio broadcasting. The course will be built around actual practice in writing interpretive material. Each student will have the privilege of preparing articles or addresses on subjects of his own selection. These will be used as a basis for class discussions. The main purpose will be to aid each student select significant subjects for articles or addresses, organize the material properly, present it in a way that it will appeal to the readers of specific journals or to radio listeners, and finally, edit the material for effectiveness in style. Criticisms will be made by both instructors and students. Addresses will be broadcast on the Department's practice equipment and criticisms will be offered on the basis of auditions rather than on critical readings. The enrollment for this course is limited to 15 students, to permit the instructors to give individual attention to the writings of each student. However, a minimum of 8 is required.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester).--Dr. M.C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning September 25. Room 500, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY STATISTICAL METHODS (year).--B. R. Stauber. Monday and Wednesday, beginning September 25. Room 2050, South Building.

First semester.-- This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Second semester.--This will be a continuation of the first semester. It will be devoted entirely to the different phases of correlation, starting with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ADMINISTRATIVE LAW (one semester).--John F. Moore. Monday and Wednesday, beginning September 25. Room 448 Administration Building. The course will consist of the following lectures:

(1) Theory of Administration
Methods, processes and schemation of administration; centralized and decentralized administration.

(2) Administrative Functions
Nature, extent and position of administrative functions. Discretionary powers and ministerial duties.

(3) Constitutional and statutory basis for Executive and Judicial administration.

(4) Administration by the Executive and the Judiciary.
Control of the Executive by the Judiciary by the injunction and by ordinary and extraordinary legal processes.

(5) Departments, Bureaus, Boards, Commissions, Officers and Agents.

(6) The Organic Act and other statutes defining the functions and duties of the Department of Agriculture.

(7) The regulatory statutes administered by the Department.

(8) The legal force and effect of Departmental Regulations.

(9) The principles of statutory construction.

(10) The legal activities of the Department in relationship to private rights.

(11) Federal and State relationships affected by this Department's activities.

(12) Government contracts.

SCIENTIFIC FRENCH (year).--Dr. H. B. Humphrey. Monday and Wednesday, beginning September 25. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Jousier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning September 26. Room 213-215 West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of dis-

use. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY RUSSIAN (year).-- Dr. C. H. Leineweber. Wednesday and Friday (suitable dates will be arranged with the class), beginning September 27. Room 1438, South Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook : Bondar's Simplified Russian Method.

ADVANCED RUSSIAN (year).-- Dr. C. H. Leineweber, Tuesday and Thursday, beginning September 26. Room 1438, South Building.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

ELEMENTARY SPANISH.— A course in Spanish will be arranged by Dr. C. H. Leineweber in case there are at least 14 students. First meeting will take place Monday, September 25, 5 o'clock. Room 1438, South Building.

Dr. A. F. Woods,
Director of Scientific Work,
Chairman of Graduate School.

Dear Doctor Woods:

I expect to take the course or courses checked in the following list:

GRADUATE COURSES

(1) Control of Plant Diseases
(2) Advanced General Chemistry
(3) Soils and Fertilizers
(4) Plant Genetics
(5) Advanced Statistics for Biological Workers
(6) Recent Advances in Enzyme Chemistry
(7) Principles of Animal Pathology
(8) An Introduction to Organic Chemistry
(9) Advanced Organic Chemistry
(10) Physiological Chemistry
(11) Taxonomic Mycology
(12) Comparative Nematology
(13) Advanced Statistical Analysis
(14) Adjustment of Observations
(15) Plant Geography
(16) History of American Agriculture
(17) Business Cycles in Relation to Agriculture
(18) Soils of the United States Based on the Atlas
(19) Scientific Instruments and their Use

UNDERGRADUATE COURSES

(20) Glass Blowing
(21) Systematic Botany
(22) Interpreting Agriculture and Home Economics
(23) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(24) Elementary Statistical Methods
(25) Administrative Law
(26) Scientific French
(27) Intermediate Scientific German
(28) Elementary Russian
(29) Advanced Russian
(30) Elementary Spanish

If given I would also take a course in.....

.....

Name.....

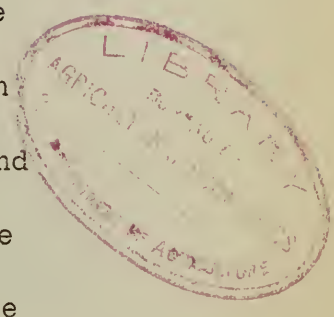
Address.....

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

April 7, 1933

MEMORANDUM
FOR CHIEFS OF BUREAUS AND OTHERS
INTERESTED

Under the auspices of the Graduate School of the Department of Agriculture Dr. Wouter Bosch, Research Chemist of Holland, will give a lecture on Enclosing and Partial Reclamation of the Zuider Zee, Holland. The lecture will be delivered April 10, beginning at three o'clock, in the United States National Museum Auditorium.



Four reels will be used to illustrate the lecture. Doctor Bosch is thoroughly familiar with the English language and is a good speaker, I am told.

You are invited to attend.

A. F. Woods
Director of Scientific Work.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

August 15
1933

G R A D U A T E S C H O O L

P R E L I M I N A R Y A N N O U N C E M E N T

The Graduate School of the United States Department of Agriculture will open the 1933-34 school year the week beginning September 25. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. The tuition is $21.50 for two semesters, or $12.50 for the first semester and $9 for the second, and is payable in advance.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested to see if there is enough to make it self-supporting. In cases where there is a sufficient number, an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School: "In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree.

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, C ornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph. D., M. A., M. S., B. A., and B. S. degrees.

Catalogues of universities and land-grant colleges are kept in my office available for consultation.

Dr. Malcolm M. Haring, University of Maryland, will give a course at the University in colloid chemistry, with special reference to the needs of students of our Graduate School. The description of the course follows:

"Chem. 212 f. Credits (2), with laboratory (4). This is a thorough course in the chemistry of matter associated with surface energy. The first semester stresses the theoretical aspects of the subject.

"Chem. 212 s. Credits (2), with laboratory (4). This is a continuation of Chem. 212 f. The second semester's work deals with some of the practical applications of the principles studied previously.

"Lectures will be given Monday and Wednesday evening at 6:30 in Room DD-107, Chemistry Building, University of Maryland. The course will start Monday, September 25, and continue throughout the year. Laboratory periods will follow the lecture periods, i. e., at 7:30, in Room DD-211, and will be of 3 hours duration. Tuition for the course will be $10 per credit hour."

A list of the courses to be offered will be found on the last page. Please check the course or courses you expect to take, detach the sheet, and <u>return it to me promptly</u>, as it is especially desirable this year that we know in advance how many will enroll for each class.

As times are now heading toward normal this will probably be the last year tuition will be reduced.

Yours very truly,

A. F. Woods,
Director of Scientific Work,
Chairman of Graduate School.

GRADUATE COURSES

CONTROL OF PLANT DISEASES (year).--Dr. M. B. Waite and various associates in the Bureau of Plant Industry. Monday, Wednesday, and Friday, beginning September 27. Room 318, West Wing.

The present status of successful control of all types of diseases on all hosts, arranged mainly on a crop basis. Without minimizing the importance of the use of fungicides, particular attention will be paid to methods other than spraying and dusting, including the newer and unusual methods of plant disease prevention and control. While not intended as a complete course in plant pathology, which requires laboratory work, the lectures will include sufficient general information in plant pathology to enable the student to understand the theory of successful treatments. There will be discussions of the causes of environmental and physiological diseases, the behavior and infection methods of virus diseases, and of the life history, character of the organisms, infection methods, and epidemiology of the parasitic diseases. Information not yet in books and bulletins will be given, and publications freely cited for reading and reference during the course.

ADVANCED GENERAL CHEMISTRY (Based on the Periodic System) (year).--Horace G. Byers. Monday and Wednesday, beginning September 25. Room 101, East Wing.

The course will consist of an historical development of the fundamental laws and theories of chemistry, which ultimately made possible the development of the periodic system. This system will then be made the basis for the organization of the general chemical relationships shown by the elements which have led to the development of the modern laws and theories. Especial stress will be laid upon the question of atomic structure. The work will consist of lectures, which are to be supplemented by library research by the students. The results of the library work will be reported in papers which may be presented in class. Since the organization of the details of the course will depend largely on the number of students, it will be essential that all registrations be in well in advance of the first meeting of the class

SOILS AND FERTILIZERS (year).

First semester.--Composition of Soils. Dr. Horace G. Byers and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning September 26. Room 101, East Wing.

The course will discuss the origin of soils and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics stressed will be: Soil Constitution, soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes demonstrated will include mechanical analysis, base exchange methods, electro-dialysis, cataphoresis, and hydrogen-ion determinations. Prerequisites for the course: Graduation from an agricultural college or equivalent under-graduate work in chemistry and physics.

Second semester.--Manufacture, Theory and Use of Fertilizers, R. O. E. Davis and other members of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning after close of first semester.

This course by a number of specialists will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to the maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, methods of preparation, new developments in commercial manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning September 26. Room 223-24, East Wing.

A development of the genetic principles that underlie plant-breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modity germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year). -- Dr. W. B. Kemp. Monday, 2 hours, beginning September 25. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

RECENT ADVANCES IN ENZYME CHEMISTRY (one semester) --Dr. A.K. Balls. Wednesday, September 27, at which meeting two days a week will be decided on for holding the class. Room 214, 216 13th St. S.W.

This will be a seminar course. The aim is to study in detail a number of the recent important contributions to the literature of enzyme action. Students must possess a general knowledge of enzyme chemistry, equivalent to the introductory course of last semester, and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

PRINCIPLES OF ANIMAL PATHOLOGY (year).-- Dr. Robert J. Formad. Wednesday and Thursday, beginning September 27. Room 223-24.

Fundamental principles of structure and metabolism of cells and tissues; the relationship of body fluids to the tissues; disturbances of circulation; disturbances of nutrition and metabolism; defense of the body against injuries; inflammatory processes; injuries, reaction and attempted repair; outline of neoplasms; special pathology and consideration of the fundamental processes in the essential organs. Prerequisite animal histology.

Lectures will be supplemented as far as possible by microscopic study of slides illustrating the tissue changes.

AN INTRODUCTION TO ORGANIC CHEMISTRY (year).-- Dr. E. P. Clark. Monday and Thursday, beginning September 25. Room 509, 216 13th Street, S. W.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development

of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

ADVANCED ORGANIC CHEMISTRY (year) --Dr. H. L. Haller. Tuesday and Thursday, classes to be held at 8 a.m. Room 213 in 216 13th St., S.W. Beginning September 26.

The course will be devoted to a more advanced study of the compounds of carbon. Topics to be covered are the carbohydrates, proteins, fats, terpens, alkaloids, dyes, drugs, plant pigments, stereochemistry, etc. The subject matter will be varied to suit the needs of the particular group enrolled. An elementary course in organic chemistry or its equivalent is a prerequisite.

PHYSIOLOGICAL CHEMISTRY (year).--Paul E. Howe. Tuesday and Thursday, beginning September 26. Room H-337, Bldg. F.

First Semester.- A course on the elementary principles of physiological chemistry will be developed with reference to the needs of the class. It will deal with the characteristics of food stuffs, the processes involved in their conversion and assimilation by the body, the characteristics of body fluids and secretions, the products of excretion and characteristics of body tissues and the process of metabolism.

Second Semester.- The course will deal with selected topics relating expecially to body fluids, tissues, excretions and secretions, with the consideration of physiological activity in relation to biochemical processes in chemistry. A consideration of the endocrine glands on metabolic activity.

TAXONOMIC MYCOLOGY (year).--William W. Diehl. Tuesday, September 26 (two laboratory periods of two hours, each, time to be arranged) Room 334, West Wing.

This course is planned for those persons previously equipped with a general knowledge of fungus morphology who desire an intimate acquaintance with methods and the technical literature of taxonomic mycology. Chief consideration will be given to a study and identification of specimens gathered by members of the class.

COMPARATIVE NEMATOLOGY (year).--Dr. B. G. Chitwood. Wednesday and Friday, beginning September 27. Room 217-218 East Wing.

First Semester.- Will be devoted to the morphology and histology of nematodes, with particular reference to the significance of such information in evolution and classification. Prerequisites, 4 college courses in zoology or the equivalent.

Second Semester.- Will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the first semester. Each student will be given material to study at his convenience, and the laboratory work will corrdinate with the lectures. Each student must have a microscope at his disposal.

Informal laboratories equivalent to 2 hours per week will be included, and in addition considerable work in the way of collecting and identification will be required.

ADVANCED STATISTICAL ANALYSIS (year).-- Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning September 25. Room 2050, South Building.

First semester.--The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simple and multiple correlation, emphasizing the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's Introduction to the Theory of Statistics, Ezekiel's Methods of Correlation Analysis, and R. A. Fisher's Statistical Methods for Research Workers' will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second semester.-- Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

ADJUSTMENT OF OBSERVATIONS -- Dr. W. Edwards Deming. Friday, September 29, when two weekly dates will be arranged. Room 2050 for first class.

First semester.- This course will treat the theory of errors from the fundamentals of simple statistics. It will begin with a review of the mathematics for the course. After some work in the calculation of moments of areas and in simple probability, the distribution of statistics of samples from a normal universe will be studied. This will be followed by the inverse argument of estimating the constants of the universe from which a sample has been drawn. It will be shown that this is precisely the problem that arises whenever observational data are collected for the purpose of estimating the value of some quantity. The five fiducial tests for hypotheses respecting the parent population will be analyzed. Bayes' theorem, Laplace's generalization of it, and the posterior method of estimation will be applied to the interpretation of data, and will be compared with the fiducial tests. The existence curves of Molina and Wilkinson will be used in several examples. No text will be used, but papers by Helmert, "Student", R. A. Fisher, Karl Pearson, Neyman, Egon Pearson, Shewhart, Keynes, Molina, and Wilkinson will be consulted.

Second semester.- The subject of least squares and empirical curves will be treated from the general and simplifying view point made possible by recent developments in the subject. By this method, observations on unrelated quantities, those connected by rigorous conditions, and those related by an empirical formula will be found amenable to a single simple scheme of adjustment. Comparisons will be made between the logic and labor of various methods for estimating the parameters of an empirical formula. Short cuts and checks in computation will be explained. Change in functional forms to produce linearity will be treated, and this will lead to the evaluation of derivatives from observational data. Some attention will be given to Karl Pearson's Chi - test for goodness of fit. Prerequisite: calculus.

PLANT GEOGRAPHY (second semester).--C. O. Erlanson. Wednesday and Friday. Room H-150, Building F.

A lecture course designed to clarify in the student's mind the components of the broad subject of plant geography. The historical development of the science, the various schools of thought and individual major

problems will be discussed. The vegetation of the various parts of the world will be described in general, and certain of the more important economic plants will be taken up in detail. Prerequisites: Elementary and Systematic Botany.

HISTORY OF AMERICAN AGRICULTURE (year).-- Everett E. Edwards. Tuesday and Thursday, beginning September 26. Room 1040 South Building.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic coast; indigenous and foreign contributions to American agriculture - Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, Franch influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.-- A consideration of the following topics: Agriculture' relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (year).--Mr. L. H. Bean, Tuesday and Friday, beginning September 26. Place of meeting will be announced in Final announcement.

First semester.- The first semester will cover (1) a review of the theories of business cycles, (2) a review of recent statistical contributions to the theory and characteristics of business cycles, (3) an examination of methods currently employed in measuring business cycles, and (4) a review of measures adopted during 1929-1933 to initiate business revival.

Second semester.- This semester will deal with certain interrelations between business and agriculture, such as the place of agriculture in the various theories of business cycles; the influences of agricultural production on industrial activity, of farm income on the market for industrial products, and of prices on agricultural and industrial production, speculation, and foreign trade; the influences of industrial conditions, employment, and the buying power of urban consumers on agricultural prices, farm expenditures, and net farm income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture; agricultural depressions, past and present; the place of agriculture in the effort toward business revival in 1933.

SOIL GENESIS, CLASSIFICATION, AND MAPPING. (one semester).-- Dr. Curtis F. Marbut. Monday, Wednesday and Friday, beginning December 4. Room 7311, Building F.

The purpose of this course is to explain the new concept of the soils, including the basis and principles of soil classification of the United States and of the World. This course will include the latest methods to be adopted in Land Classification. The latter subject is much in evidence because of the agricultural crisis now existing.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester).--Tuesday and Thursday, beginning Feb. 6. Room 110.

A composite course of thirty lectures by workers in this Department, the Bureau of Standards, and other laboratories, one or more lectures to be given by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Most of the meetings of the class will necessarily be held in laboratories where the special apparatus is installed. A list of the subjects and lecturers will be given in the Final Announcement.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning September 25. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repitition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (year).--Dr. S.F. Blake. Monday and Wednesday, beginning September 25. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower will be studied. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (year).--M. S. Eisenhower and staff. Tuesday and Thursday, beginning September 26. Room 302, Administration Building.

Students will be required to prepare interpretive articles for magazines and newspapers, as well as interpretive addresses for radio broadcasting. The course will be built around actual practice in writing interpretive material. Each student will have the privilege of preparing articles or addresses on subjects of his own selection. These will be used as a basis for class discussions. The main purpose will be to aid each student select significant subjects for articles or addresses, organize the material properly, present it in a way that it will appeal to the readers of specific journals or to radio listeners, and finally, edit the material for effectiveness in style. Criticisms will be made by both instructors and students. Addresses will be broadcast on the Department's practice equipment and criticisms will be offered on the basis of auditions rather than on critical readings. The enrollment for this course is limited to 15 students, to permit the instructors to give individual attention to the writings of each student. However, a minimum of 8 is required.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester).--Dr. M.C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning September 25. Room 500, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY STATISTICAL METHODS (year).--B. R. Stauber. Monday and Wednesday, beginning September 25. Room 2050, South Building.

First semester.-- This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Second semester.--This will be a continuation of the first semester. It will be devoted entirely to the different phases of correlation, starting with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ADMINISTRATIVE LAW (one semester).--John F. Moore. Monday and Wednesday, beginning September 25. Room 448 Administration Building. The course will consist of the following lectures:

(1) Theory of Administration
Methods, processes and schemation of administration; centralized and decentralized administration.

(2) Administrative Functions
Nature, extent and position of administrative functions. Discretionary powers and ministerial duties.

(3) Constitutional and statutory basis for Executive and Judicial administration.

(4) Administration by the Executive and the Judiciary.
Control of the Executive by the Judiciary by the injunction and by ordinary and extraordinary legal processes.

(5) Departments, Bureaus, Boards, Commissions, Officers and Agents.

(6) The Organic Act and other statutes defining the functions and duties of the Department of Agriculture.

(7) The regulatory statutes administered by the Department.

(8) The legal force and effect of Departmental Regulations.

(9) The principles of statutory construction.

(10) The legal activities of the Department in relationship to private rights.

(11) Federal and State relationships affected by this Department's activities.

(12) Government contracts.

SCIENTIFIC FRENCH (year).--Dr. H. B. Humphrey. Monday and Wednesday, beginning September 25. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Jousier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning September 26. Room 213-215 West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of dis-

use. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY RUSSIAN (year).-- Dr. C. H. Leineweber. Wednesday and Friday (suitable dates will be arranged with the class), beginning September 27. Room 1438, South Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook : Bondar's Simplified Russian Method.

ADVANCED RUSSIAN (year).-- Dr. C. H. Leineweber, Tuesday and Thursday, beginning September 26. Room 1438, South Building.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

ELEMENTARY SPANISH.— A course in Spanish will be arranged by Dr. C. H. Leineweber in case there are at least 14 students. First meeting will take place Monday, September 25, 5 o'clock. Room 1438, South Building.

Dr. A. F. Woods,
Director of Scientific Work,
Chairman of Graduate School.

Dear Doctor Woods:

I expect to take the course or courses checked in the following list:

GRADUATE COURSES

(1) Control of Plant Diseases
(2) Advanced General Chemistry
(3) Soils and Fertilizers
(4) Plant Genetics
(5) Advanced Statistics for Biological Workers
(6) Recent Advances in Enzyme Chemistry
(7) Principles of Animal Pathology
(8) An Introduction to Organic Chemistry
(9) Advanced Organic Chemistry
(10) Physiological Chemistry
(11) Taxonomic Mycology
(12) Comparative Nematology
(13) Advanced Statistical Analysis
(14) Adjustment of Observations
(15) Plant Geography
(16) History of American Agriculture
(17) Business Cycles in Relation to Agriculture
(18) Soils of the United States Based on the Atlas
(19) Scientific Instruments and their Use

UNDERGRADUATE COURSES

(20) Glass Blowing
(21) Systematic Botany
(22) Interpreting Agriculture and Home Economics
(23) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(24) Elementary Statistical Methods
(25) Administrative Law
(26) Scientific French
(27) Intermediate Scientific German
(28) Elementary Russian
(29) Advanced Russian
(30) Elementary Spanish

If given I would also take a course in.....

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Name.....

Address.....

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

September 15

1933

G R A D U A T E S C H O O L

F I N A L A N N O U N C E M E N T

The Graduate School of the United States Department of Agriculture will open the 1933-34 school year the week beginning September 25. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. The tuition is $21.50 for two semesters, or $12.50 for the first semester and $9 for the second, and is payable in advance.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested to see if there is enough to make them self-supporting. In cases where there is a sufficient number, an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School: "In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree.

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, Cornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph. D., M. A., M. S., B. A., and B. S. degrees.

Catalogues of universities and land-grant colleges are kept in my office available for consultation.

Dr. Malcolm M. Haring, University of Maryland, will give a course at the University in colloid chemistry, with special reference to the needs of students of our Graduate School. The description of the course follows:

"Chem. 212 f. Credits (2), with laboratory (4). This is a thorough course in the chemistry of matter associated with surface energy. The first semester stresses the theoretical aspects of the subject.

"Chem. 212 s. Credits (2), with laboratory (4). This is a continuation of Chem. 212 f. The second semester's work deals with some of the practical applications of the principles studied previously.

"Lectures will be given Monday and Wednesday evening at 6:30 in Room DD-107, Chemistry Building, University of Maryland. The course will start Monday, September 25, and continue throughout the year. Laboratory periods will follow the lecture periods, i. e., at 7:30, in Room DD-211, and will be of 3 hours duration. Tuition for the course will be $10 per credit hour."

A list of the courses to be offered will be found on the last page. Please check the course or courses you expect to take, detach the sheet, and <u>return it to me promptly</u>, as it is especially desirable this year that we know in advance how many will enroll for each class.

As times are now heading toward normal this will probably be the last year tuition will be reduced.

Yours very truly,

A. F. Woods,
Director of Scientific Work,
Chairman of Graduate School.

GRADUATE COURSES

CONTROL OF PLANT DISEASES (year). --Dr. M. B. Waite and various associates in the Bureau of Plant Industry. Monday, Wednesday, and Friday, beginning September 25. Room 318, West Wing.

The present status of successful control of all types of diseases on various hosts, arranged mainly on a crop plant basis. Without minimizing the importance of the use of fungicides, particular attention will be paid to methods other than spraying and dusting, including the newer and unusual methods of plant disease prevention and control. While not intended as a complete course in plant pathology, which requires laboratory work, the lectures will include sufficient general information in plant pathology to enable the student to understand the theory of successful treatments. There will be discussions of the causes of environmental and physiological diseases, the behavior and infection methods of virus diseases, and of the life history, character of the organisms, infection methods, and epidemiology of the parasitic diseases. Information not yet in books and bulletins will be given, and publications freely cited for reading and reference during the course.

ADVANCED GENERAL CHEMISTRY (Based on the Periodoc System) (year).--Horace G. Byers. Monday and Wednesday, beginning September 25. Room 101, East Wing.

The course will consist of an historical development of the fundamental laws and theories of chemistry, which ultimately made possible the development of the periodic system. This system will then be made the basis for the organization of the general chemical relationships shown by the elements which have led to the development of the modern laws and theories. Especial stress will be laid upon the question of atomic structure. The work will consist of lectures, which are to be supplemented by library research by the students. The results of the library work will be reported in papers, which may be presented in class. Since the organization of the details of the course will depend largely on the number of students, it will be essential that all registrations be in well in advance of the first meeting of the class.

SOILS AND FERTILIZERS (year).

First semester.--Composition of Soils. Dr. Horace G. Byers and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning September 26. Room 101, East Wing.

The course will discuss the origin of soils and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics stressed will be: Soil constitution, soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes demonstrated will include mechanical analysis, base exchange methods, electro-dialysis, cataphoresis, and hydrogen-ion determinations. Prerequisites for the course: Graduation from an Agricultural college or equivalent under-graduate work in chemistry and physics.

Second semester.--Manufacture, Theory and Use of Fertilizers. R. O. E. Davis and other members of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning after close of first semester.

This course by a number of specialists will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to the maintenance or soil fertility. It will consider the development of commercial fertilizers, sources of materials, methods of preparation, new developments in commercial manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning September 26. Room 223-24, East Wing.

A development of the genetic principles that underlie plant-breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modify germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).--Dr. W. B. Kemp. Monday, 2 hours, beginning September 25. Room 223-24, East Wing.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological researdh. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

RECENT ADVANCES IN ENZYME CHEMISTRY (one semester).--Dr. A. K. Balls. Wednesday, September 27, at which meeting two days a week will be decided on for holding the class. Room 214, 216, 13th St. S. W.

This will be a seminar course. The aim is to study in detail a number of the recent important contributions to the literature of enzyme action. Students must possess a general knowledge of enzyme chemistry, equivalent to the introductory course of last semester, and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

PRINCIPLES OF ANIMAL PATHOLOGY (year).--Dr. Robert J. Formad. Wednesday and Thursday, beginning September 27. Room 223-24.

Fundamental principles of structure and metabolism of cells and tissues; the relationship of body fluids to the tissues; disturbances of circulation; disturbances of nutrition and metabolism; defense of the body against injuries; inflammatory processes; injuries, reaction and attempted repair; outline of neoplasms; special pathology and consideration of the fundamental processes in the essential organs. Prerequisite animal histology.

Lectures will be supplemented as far as possible by microscopic study of slides illustrating the tissue changes.

AN INTRODUCTION TO ORGANIC CHEMISTRY (year).--Dr. E. P. Clark. Monday and Thursday, beginning September 25. Room 509, 216, 13th St., S. W.

This course will consist of a series of lectures covering the fundamental principles of general orgainc chemistry. Such topics as classification, nomenclature, type reaction, and structure will be adequately considered. Historically important discoveries will be correlated with the development.

of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

ADVANCED ORGANIC CHEMISTRY (year).--Dr. H. L. Haller. Tuesday and Thursday, classes to be held at 8 a.m. Room 213 in 216 13th St., S.W. Beginning September 26.

The course will be devoted to a more advanced study of the compounds of carbon. Topics to be covered are the carbohydrates, proteins, fats, terpens, alkaloids, dyes, drugs, plant pigments, stereochemistry, etc. The subject matter will be varied to suit the needs of the particular group enrolled. An elementary course in organic chemistry or its equivalent is a prerequisite.

PHYSIOLOGICAL CHEMISTRY (year).--Paul E. Howe. Tuesday and Thursday, beginning September 26. Room H-337, Bldg. F.

First Semester.-A course on the elementary principles of physiological chemistry will be developed with reference to the needs of the class. It will deal with the characteristics of food stuffs, the processes involved in their conversion and assimilation by the body, the characteristics of body fluids and secretions, the products of excretion and characteristics of body tissues and the process of metabolism.

Second Semester.-The course will deal with selected topics relating especially to body fluids, tissues, excretions and secretions, with the consideration of physiological activity in relation to biochemical processes in chemistry. A consideration of the endocrine glands on metabolic activity.

TAXONOMIC MYCOLOGY (year).--William W. Diehl. Tuesday, September 26 (two laboratory periods of two hours, each, time to be arranged) Room 334, West Wing.

This course is planned for those persons previously equipped with a general knowledge of fungus morphology who desire an intimate acquaintance with methods and the technical literature of taxonomic mycology. Chief consideration will be given to a study and identification of specimens gathered by members of the class.

COMPARATIVE NEMATOLOGY (year)|--Dr. B. G. Chitwood. Wednesday and Friday, beginning September 27. Room 217-218 East Wing.

First Semester.--Will be devoted to the morphology and histology of nematodes, with particular reference to the significance of such information in evolution and classification. Prerequisites, 4 college courses in zoology or the equivalent.

Second Semester.- Will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the hife histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the first semester. Each student will be given material to study at his convenience, and the laboratory work will corrdinate with the lectures. Each student must have a microscope at his disposal.

Informal laboratories equivalent to 2 hours per week will be included, and in addition considerable work in the way of collecting and identification will be required.

ADVANCED STATISTICAL ANALYSIS (year).-- Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning September 26. Room 2050, South Building.

First semester.--The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simple and multiple correlation, emphasizing the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's Introduction to the Theory of Statistics, Ezekiel's Methods of Correlation Analysis, and R. A. Fisher's Statistical Methods for Research Workers' will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second semester.--Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

ADJUSTMENT OF OBSERVATIONS.--Dr. W. Edwards Deming. Friday, September 29, when two weekly dates will be arranged. Room 2050 for first class.

First semester.- This course will treat the theory of errors from the fundamentals of simple statistics. It will begin with a review of the mathematics for the course. After some work in the calculation of moments of areas and in simple probability, the distribution of statistics of samples from a normal universe will be studied. This will be followed by the inverse argument of estimating the constants of the universe from which a sample has been drawn. It will be shown that this is precisely the problem that arises whenever observational data are collected for the purpose of estimating the value of some quantity. The five fiducial tests for hypotheses respecting the parent population will be analyzed. Bayes' theorem, Laplace's generalization of it, and the posterior method of estimation will be applied to the interpretation of data, and will be compared with the fiducial tests. The existence curves of Molina and Wilkinson will be used in several examples. No text will be used, but papers by Helmert, "Student", R. A. Fisher, Karl Pearson, Neyman, Egon Pearson, Shewhart, Keynes, Molina, and Wilkinson will be consulted.

Second semester.- The subject of least squares and empirical curves will be treated from the general and simplifying view point made possible by recent developments in the subject. By this method, observations on unrelated quantities, those connected by rigorous conditions, and those related by an empirical formula will be found amenable to a single simple scheme of adjustment. Comparisons will be made between the logic and labor of various methods for estimating the parameters of an empirical formula. Short cuts and checks in computation will be explained. Change in functional forms to produce linearity will be treated, and this will lead to the evaluation of derivatives from observational data. Some attention will be given to Karl Pearson's Chi - test for goodness of fit. Prerequisite: calculus.

PLANT GEOGRAPHY (second semester).--C. O. Erlanson. Wednesday and Friday beginning September 27. Room H-150, Building F.

A lecture course designed to clarify in the student's mind the components of the broad subject of plant geography. The historical development of the science, the various schools of thought and individual major

problems will be discussed. The vegetation of the various parts of the world will be described in general, and certain of the more important economic plants will be taken up in detail. Prerequisites: Elementary and Systematic Botany.

HISTORY OF AMERICAN AGRICULTURE (year).— Everett E. Edwards. Tuesday and Thursday, beginning September 26. Room 1040 South Building.

First semester.—A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic coast; indigenous and foreign contributions to American agriculture; Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.—A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade; analyses, and proposed solutions.

BUSINESS CYCLES IN RELATION TO AGRICULTURE (year).--Mr. L. H. Bean, Tuesday and Friday, beginning September 26. Room 5039, South Building.

First semester.- The first semester will cover (1) a review of the theories of business cycles, (2) a review of recent statistical contributions to the theory and characteristics of business cycles, (3) an examination of methods currently employed in measuring business cycles, and (4) a review of measures adopted during 1929-1933 to initiate business revival.

Second semester.- This semester will deal with certain interrelations between business and agriculture, such as the place of agriculture in the various theories of business cycles; the influences of agricultural production on industrial activity, of farm income on the market for industrial products, and of prices on agricultural and industrial production, speculation, and foreign trade; the influences of industrial conditions, employment, and the buying power of urban consumers on agricultural prices, farm expenditures, and net farm income; the relative importance of the agricultural influences on business activity and of business conditions on the welfare of agriculture; agricultural depressions, past and present; the place of agriculture in the effort toward business revival in 1933.

SOIL GENESIS, CLASSIFICATION, AND MAPPING. (one semester).-- Dr. Curtis F. Marbut. Monday, Wednesday, and Friday, beginning December 4. Room 7311, Building F.

The purpose of this course is to explain the new concept of the soils, including the basis and principles of soil classification of the United States and of the World. This course will include the latest methods to be adopted in Land Classification. The latter subject is much in evidence because of the agricultural crisis now existing.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester).—Tuesday and Thursday, beginning Feb. 6. Room 110, West Wing.

A composite course of thirty lectures by workers in this Department, the Bureau of Standards, and other laboratories, one or more lectures to be given by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Most of the meetings of the class will necessarily be held in laboratories where the special apparatus is installed. A list of the subjects and lectures will be given in the announcement for the second semester.

THEORY OF PRICES AND PRICE MAKING (year) - Mr. H. J. Wadleigh, beginning September 25, Room 2428 South Building. Mondays and Wednesdays. (Consultation in Room 3096 South Building).

This course will deal with the more advanced aspects of price theory, with special emphasis on recent developments of the theory. Students are expected to know the elements of price theory included in the course in Elementary Economics. A syllabus of the course with a list of readings will be available at the first lecture.

First Semester.—A general survey of equilibrium economics and its application to some agricultural economic problems, including the following topics: (1) The scientific method in economics; (2) the meaning of demand and supply curves in their application to problems of statistical price analysis; (3) the theory of distribution (including the theory of the rate of interest), with an examination of criticisms which have been made against the theory of marginal productivity in connection with wage theory; and (4) application to price fixing.

Second Semester.—Treatment of some recent developments of economic theory including: (1) The theory of monopoly and its recent extension to problems of price under conditions of imperfect competition in our present industrial system; (2) equilibrium economics in relation to monetary and business cycle theory; (3) the institutional school of economics; and (4) welfare economics and social control.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning September 25. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Monday and Wednesday, beginning October 16. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower will be studied. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (year).--M. S. Eisenhower and staff. Tuesday and Thursday, beginning September 26. Room 302, Administration Building.

Students will be required to prepare interpretive articles for magazines and newspapers, as well as interpretive addresses for radio broadcasting. The course will be built around actual practice in writing interpretive material. Each student will have the privilege of preparing articles or addresses on subjects of his own selection. These will be used as a basis for class discussions. The main purpose will be to aid each student select significant subjects for articles or addresses, organize the material properly, present it in a way that it will appeal to the readers of specific journals or to radio listeners, and finally, edit the material for effectiveness in style. Criticisms will be made by both instructors and students. Addresses will be broadcast on the Department's practice equipment and criticisms will be offered on the basis of auditions rather than on critical readings. The enrollment for this course is limited to 15 students, to permit the instructors to give individual attention to the writings of each student. However, a minimum of 8 is required.

ELEMENTS OF ECONOMICS (year).--Dr. L. Volin, Tuesday, September 26, at 5 P.M., at which meeting two days a week will be decided on for holding the class. Room 3907, The South Building.

This will be an introductory course in economic principles and institutions. It will aim to give a picture of the modern economic society, its organization and functioning and to serve as a foundation for more advanced and specialized study of economics. Among the subjects treated will be: Value and price determination; money and credit; business cycle and the price level; distribution of income, taxation, types of business organization in industry and agriculture; international trade and commercial policies; the labor problem; public control of economic activity and proposals of economic reform.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester).--Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning September 25. Room 500, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY STATISTICAL METHODS (year).--B. R. Stauber and F. J. Hosking. Monday and Wednesday, beginning September 25, Room 2050, South Building.

First Semester.--This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Second Semester.--This will be a continuation of the first semester. It will be devoted entirely to the different phases of correlation, starting with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ADMINISTRATIVE LAW (one semester).--John F. Moore. Monday and Wednesday, beginning September 25. Room 448 Administration Building. The course will consist of the following lectures:

(1) Theory of Administration
Methods, processes and schemation of administration; centralized and decentralized administration.

(2) Administrative Functions.
Nature, extent and position of administrative functions. Discretionary powers and ministerial duties.

(3) Constitutional and statutory basis for Executive and Judicial administration.

(4) Administration by the Executive and the Judiciary.
Control of the Executive by the Judiciary by the injunction and by ordinary and extraordinary legal processes.

(5) Departments, Bureaus, Boards, Commissions, Officers and Agents.

(6) The Organic Act and other statutes defining the functions and duties of the Department of Agriculture.

(7) The regulatory statutes administered by the Department.

(8) The legal force and effect of Departmental Regulations.

(9) The principles of statutory construction.

(10) The legal activities of the Department in relationship to private rights.

(11) Federal and State relationships affected by this Department's activities.

(12) Government contracts.

PATENT LAW FOR CHEMISTS (one semester).-- Dr. Joseph Rossman. Wednesday and Friday, beginning September 27. Room 5038, South Building.

The fundimental principles of patent law of importance to chemists will be covered in this course. A study will be made of the patent statutes and leading court decisions. The types of patentable chemical inventions such as new processes, compounds, apparatus and improvements will be studied in detail. The prerequisites for the grant of chemical patents, involving the question of invention, novelty, utility, full disclosure, non-abandonment, etc., will be analyzed. The necessary procedure in obtaining patents will be outlined. Patent licenses and assignments, infringement and enforcement of patent rights will also be considered.

SCIENTIFIC FRENCH (year).--Dr. H. B. Humphrey. Monday and Wednesday, beginning September 25. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Jousier's Economic Rurale, Moffatt's Science French Course.

INTERMDEIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning September 26. Room 213-215 West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY RUSSIAN (year).--Dr. C. H. Leineweber. Wednesday and Friday (suitable dates will be arranged with the class), beginning September 27, Room 1438, South Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Method.

ADVANCED RUSSIAN (year).--Dr. C. H. Leineweber. Tuesday and Thursday, beginning September 26. Room 1438, South Building.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

ELEMENTARY SPANISH.-- A course in Spanish will be arranged by Dr. C. H. Leineweber in case there are at least 14 students. First meeting will take place Monday, September 25, 5 o'clock. Room 1438, South Building.

ELEMENTARY ITALIAN (year).--Henry E. Brockway. Tuesday and thursday. Room 3910 South Building. The course is intended to enable the student to rapidly acquire a good reading knowledge of the language. Special attention will be given to pronunciation, and terms used by Italians in agriculture and economics will be gradually introduced.

Dr. A. F. Woods,
Director of Scientific Work,
Chairman of Graduate School.

Dear Doctor Woods:

I expect to take the course or courses checked in the following list:

GRADUATE COURSES

(1) Control of Plant Diseases
(2) Advanced General Chemistry
(3) Soils andFertilizers
(4) Plant Genetics
(5) Advanced Statistics for Biological Workers
(6) Recent Advances in Enzyme Chemistry
(7) Principles of Animal Pathology
(8) An Introduction to Organic Chemistry
(9) Advanced Organic Chemistry
(10) Physiological Chemistry
(11) Taxonomic Mycology
(12) Comparative Nematology
(13) Advanced Statistical Analysis
(14) Adjustment of Observations
(15) Plant Geography
(16) History of American Agriculture
(17) Business Cycles in Relation to Agriculture
(18) Soils of the United States Based on the Atlas
(19) Scientific Instruments and their Use
(20) Theory of Prices and Price Making

UNDERGRADUATE COURSES

(21) Glass Blowing
(22) Systematic Botany
(23) Elements of Economics
(24) Interpreting Agriculture and Home Economics
(25) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(26) Elementary Statistical Methods
(27) Administrative Law
(28) Patent Law for Chemists
(29) Scientific French
(30) Intermediate Scientific German
(31) Elementary Russian
(32) Advanced Russian
(33) Elementary Spanish
(34) Elementary Italian

If given I would also take a course in . . . . . .

. . . . . .

Name. . . . . .

Address . . . . . .

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON, D. C.

September 25
1933

In addition to the courses mentioned in the Final Announcement of the Graduate School the following course will be offered, beginning Saturday, October 7, at 1:30:

PLANT ANATOMY (year).--Dr. Ernst Artschwager. Saturday, October 7, at 1:30. Room 401 West Wing.

The course is designed to give a working acquaintance with the internal structure of vascular plants, and emphasis will be placed on practice in interpretation and determination of material.

A. F. Woods
Director of Scientific Work,
Chairman Graduate School.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

November 24
1933

G R A D U A T E S C H O O L

ANNOUNCEMENT OF COURSE IN SOIL GENESIS, CLASSIFICATION, AND MAPPING.

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U.S. DEPARTMENT

Beginning December 4 the Graduate School will offer a course in Soil Genesis, Classification, and Mapping. The course will be given by Dr. Curtis F. Marbut and will consist of one semester of thirty hours. The classes will be held at 4:40 on Monday, Wednesday, and Friday, in Room 7310, Building F.

The purpose of the course is to explain the new concept of the soils, including the basis and principles of soil classification of the United States and of the world. This course will include the latest methods to be adopted in Land Classification. The latter subject is much in evidence because of the agricultural crisis now existing.

A. F. Woods
Director of Scientific Work,
Chairman Graduate School.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

November 24
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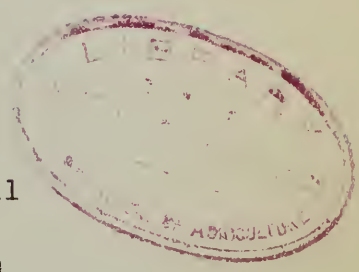

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A. F. Woods
Director of Scientific Work,
Chairman Graduate School.

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUTATE SCHOOL

WASHINGTON

January 2, 1934

In addition to the courses mentioned in the announcement of the second semester courses to be offered by the Graduate School the following courses will be offered:

GENERAL CHEMISTRY (first semester).--Mr. R. H. Carter. First meeting, Wednesday, January 30, 1935, 4.40 p.m. in Room 205, Chemistry Building, 216-13th St., S.W.

The course is designed primarily for those who desire a more or less comprehensive knowledge of the principles and applications of chemistry rather than for those who expect to make chemistry their profession. Explanation of the fundamental principles underlying the science of chemistry, the classification of the elements, according to the periodic system, the symbols, nomenclature and classification of compounds, the mathematics and principles involved in chemical analyses and the development of some of the modern theories will be presented.

PORTUGUESE (first semester).--Dr. Emile Simon. First meeting, Wednesday, January 16, 1935, at which meeting dates for the class will be arranged. Room 4090 South Building.

A course will be offered in Elementary or Advanced Portuguese, as desired, if enough students register to warrant giving the course.

Yours very truly,

A. F. Woods,
Director of the Graduate School.

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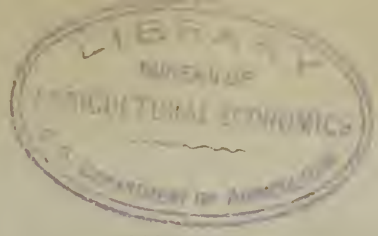

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UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
Washington

January 12
1934

G R A D U A T E S C H O O L

S E C O N D S E M E S T E R

The second semester of the Graduate School of the United States Department of Agriculture will open the week beginning January 15. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. The tuition is $9 for the second semester in case the student has taken the first semester, otherwise it is $12.50. Tuition is to be paid in advance.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested to see if there is enough to make them self-supporting. In cases where there is a sufficient number an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School: "In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, asin the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree.

A number of students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, Cornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph. D., M. A., M. S., B. A., and B. S. degrees.

Catalogues of universities and land-grant colleges are kept in my office available for consultation.

Dr. Malcolm M. Haring, University of Maryland, is giving a course at the University in colloid chemistry, with special reference to the needs of students of our Graduate School. The description of the course follows:

"Chem. 212 f. credit (2), with laboratory (4). This is a thorough course in the chemistry of matter associated with surface energy. The second semester stresses the practical aspects of the subject.

"Chem. 212 s. credits (2), with laboratory (4). This is a continuation of Chem. 212 f. The second semester's work deals with some of the practical applications of the principles studied previously.

"Lectures will be given Monday and Wednesday evenings at 6.30 in Room DD-107, Chemistry Building, University of Maryland. The second semester will follow the close of the first semester. Laboratory periods will follow the lecture periods, i.e., at 7:30, in Room DD-211, and will be of 3 hours duration. Tuition $10 per credit hour."

A. F. Woods

A. F. Woods
Director of Scientific Work,
Chairman of Graduate School.

GRADUATE COURSES

SOILS AND FERTILIZERS (second semester).--Dr. R. O. E. Davis, and other members of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning January 23. Room 101, East Wing.

Manufacture, Theory and Use of Fertilizers. This course by a number of specialists will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to the maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, methods of preparation, new developments in commercial manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry.

AN INTRODUCTION TO ORGANIC CHEMISTRY (second semester).--Dr. E. P. Clark. Monday and Thursday, beginning January 29. Room 510, 216 13th St., S.W.

This course consists of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reaction, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester was devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

ADVANCED ORGANIC CHEMISTRY (second semester).--Dr. H. L. Haller. Tuesday and Thursday, beginning January 30, at 8 a.m. Room 2050 South Building.

This course is devoted to a more advanced study of the compounds of carbon. Topics to be covered are the carbohydrates, proteins, fats, terpens, alkaloids, dyes, drugs, plant pigments, stereochemistry, etc. The subject matter will be varied to suit the needs of the particular group enrolled. An elementary course in organic chemistry or its equivalent is a prerequisite.

PHYSIOLOGICAL CHEMISTRY (second semester).--Dr. Paul E. Howe. Tuesday or Thursday, beginning Tuesday, January 23, 2 hours. Room H-337, Building F.

The course deals with selected topics relating especially to body fluids, tissues, excretions and secretions, with the consideration of physiological activity in relation to biochemical processes in chemistry. A consideration of the endocrine glands on metabolic activity.

COMPARATIVE NEMATOLOGY (second semester).--Dr. B. G. Chitwood. Saturday, 2 to 4 P.M., beginning February 3. Room 217-218 East Wing.

Will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the

first semester. Each student will be given material to study at his convenience, and the laboratory work will coordinate with the lectures. Each student must have a microscope at his disposal.

Informal laboratories equivalent to 2 hours per week will be included, and in addition considerable work in the way of collecting and identification will be required.

ADVANCED STATISTICAL ANALYSIS (second semester).-- Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning January 23. Room 2050, South Building.

Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

ADJUSTMENT OF OBSERVATIONS (second semester).--Dr. W. Edwards Deming. Thursdays, beginning January 18, 4:45 to 7. Room 5038.

The subject of least squares and empirical curves will be treated from the general and simplifying view point made possible by recent developments in the subject. By this method, observations on unrelated quantities, those connected by rigorous conditions, and those related by an empirical formula will be found amenable to a single simple scheme of adjustment. Comparisons will be made between the logic and labor of various methods for estimating the parameters of an empirical formula. Short cuts and checks in computation will be explained. Change in functional forms to produce linearity will be treated, and this will lead to the evaluation of derivatives from observational data. The basis of the study of least squares will be Karl Pearson's Chi-test for Goodness of Fit. Prerequisite, calcium.

HISTORY OF AMERICAN AGRICULTURE (second semester).--Everett E. Edwards. Tuesday and Thursday, beginning February 1. Room 1040 South Building.

A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education. State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the co-operative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions. No prerequisites. The second-semester work may be taken independent of that of the first semester.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one-semester).--Tuesday and Thursday, beginning Feb. 6. Room 110, West Wing.

A composite course of thirty lectures by workers in this Department, the Bureau of Standards, and other laboratories, one or more lectures to be

given by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Most of the meetings of the class will necessarily be held in laboratories where the special apparatus is installed. A tentative list of the subjects and lectures can be had by applying to the secretary of the Graduate School.

THEORY OF PRICE AND PRICE MAKING (second semester)--Mr. H. J. Wadleigh, Mondays and Wednesdays beginning January 29, Room 5038 South Building.

The work in the second semester will be in part a development of the work of the first semester and in part will deal with certain broader aspects of economic theory. The following topics will be discussed: (1) The theory of monopoly and imperfect competition, (2) causes of the unequal distribution of incomes, (3) equilibrium economics in relation to monetary and business cycle theory, (4) the theory of international exchange, (5) institutional aspects of the capitalist economy, (6) economic policies and social control of economic activity.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (second semester)-- Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning January 15. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (one semester).--Dr. S. F. Blake. Monday and Wednesday, beginning February 5. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The parts of the plant and of the flower and the technical terms used in describing them will be considered, with a brief outline of plant classification. The greater part of the course will be devoted to the identification of wild plants of this region by the use of a manual. One field trip will be taken.

ELEMENTS OF ECONOMICS (second semester)- Dr. L. Volin, Tuesday and Friday, beginning January 30, 4:45 p.m. Room 1039, South Building. This is

an introductory course in economic principles and institutions. It aims to give a picture of the modern economic society, its organization and functioning and to serve as a foundation for more advanced and specialized study of economics. Among the subjects treated during the second semester will be money credit and foreign exchange, business cycle and the price level, international trade and commercial policies, the labor problem and proposals of economic reform. No prerequisites are required.

ELEMENTARY STATISTICAL METHODS (second semester).-- B. R. Stauber and F. J. Hosking. Monday and Wednesday, beginning January 31. Room 2050, South Building.

This will be a continuation of the first semester. It will be devoted entirely to the different phases of correlation, starting with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and multiple curvilinear correlation. The object of this semester is to enable the student to apply correlation to any type of data and to understand the significance of the different measures of correlation.

ELEMENTARY STATISTICAL METHODS (one-semester).-- B. R. Stauber and F. J. Hosking. Tuesday and Friday, beginning January 30. Room 1438, South Building.

This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

ADMINISTRATIVE LAW (second semester).-- John F. Moore. Monday, Wednesday, and Friday, beginning February 12. Room 448 Administration Building. The course will consist of the following lectures:

(1) Theory of Administration.
Methods, processes and schemation of administration; centralized and decentralized administration.

(2) Administrative Functions.
Nature, extent and position of administrative functions. Discretionary powers and ministerial duties.

(3) Constitutional and statutory basis for Executive and Judicial administration.

(4) Administration by the Executive and the Judiciary.
Control of the Executive by the Judiciary by the injunction and by ordinary and extraordinary legal processes.

(5) Departments, Bureaus, Boards, Commissions, Officers and Agents.

(6) The Organic Act and other statutes defining the functions and duties of the Department of Agriculture.

(7) The regulatory statutes administered by the Department.

(8) The legal force and effect of Departmental Regulations

(9) The principles of statutory construction.

(10) The legal activities of the Department in relationship to private rights.

(11) Federal and State relationships affected by this Department's activities.

(12) Government contracts.

HISTORY AND DEVELOPMENT OF BUSINESS LAW (one-semester).-- Richard S. Harvey. Monday, Wednesday, and Friday, beginning January 15. Room 5039, South Building.

This course will develop, step by step, the progress of commerce and the outgrowing laws from the earliest times. The stages by which our laws of commerce reached their present form is highly interesting as well as informing; and an intimate working acquaintance with those laws is necessary for persons doing efficient work both within Departments and in other lines. In addition to careful treatment of the historical side as connected with ancient and modern means of navigation and communication, etc., the legal aspect will be dealt with as to:- Legal Rights, Legal Remedies, Contracts, Conflict of Laws, Negotiable Instruments (notes, drafts, checks, etc.), Agency, Partnerships, Corporations, Sales, Bailments, Liability of Carriers (railroads, etc.), Insurance, Real Estate, Titles and Mortgages, Landlord and Tenant, Wills and Administrations.

SCIENTIFIC FRENCH (second semester). -- Dr. H. B. Humphrey. Monday and Wednesday, beginning February 5. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Livre des Champs and L'Industrie, Jousier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN(second semester). --Dr. Charles Drechsler. Tuesday and Thursday, beginning January 25. Room 215, West Wing.

Reading and translation of German scientific prose (biology, geology, meterology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester and through half of the second semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY RUSSIAN (second semester).--Dr. C. H. Leineweber. Wednesday and Friday, beginning February 2. Room 223, East Wing, Administration Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Method.

ADVANCED RUSSIAN (second semester).--Dr. C. H. Leineweber. Monday and Thursday, beginning February 1. Room 223 East Wing, Administration Building.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Texbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

BEGINNERS' RUSSIAN (one semester).--To be arranged by Dr. C. H. Leineweber in case there are enough applicants. First meeting Tuesday, February 6, 5 o'clock. Room 223 East Wing, Administration Building.

ITALIAN (second semester).--Henry E. Brockway. Tuesday and Thursday, beginning January 16. Room 3906, South Building.

The course is intended to enable the student rapidly to acquire a good reading and translating knowledge of the language. Special attention is being given to pronunciation. Russo's Elementary Italian Grammar is being used as the text book. Terms used by Italians in agriculture and economics are gradually introduced. For this semester some previous study of the language is necessary.

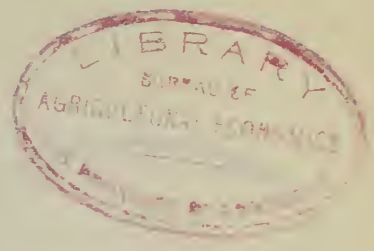
ELEMENTARY SPANISH (second semester).--Henry Bartmann. Tuesday and Friday, beginning January 23, at 5 p.m. Room 5038, South Building.

The course consists of one lesson per week in higher grammar and one lesson per week in reading Spanish text.

BEGINNERS' SPANISH (one semester).--Henry Bartmann. First meeting to organize this class will be held Monday, January 22, in Room 5038, South Building, at 5 o'clock.

UNITED STATES DEPARTMENT OF AGRICULTURE
DIRECTOR OF SCIENTIFIC WORK
WASHINGTON

June 30
1934



MEMORANDUM FOR CHIEFS OF BUREAUS

AND OTHERS INTERESTED

Dr. John Wishart, Reader in Statistics, University of Cambridge, England, and Statistician of the Rothamsted Experiment Station, Harpenden, 1927-1931, will deliver a lecture on STATISTICS IN AGRICULTURAL RESEARCH July 16, beginning at 4 o'clock.

The lecture will be given under the auspices of the Graduate School of the Department of Agriculture in the Auditorium of the Department, South Building, between wings 5 and 6. The entrance nearest to the Auditorium is on B Street, S. W.

All interested are invited to attend.

A. F. Woods
Director of Scientific Work
and Graduate School.

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

August 15

1934

LIBRARY
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AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE

P R E L I M I N A R Y A N N O U N C E M E N T

The Graduate School of the United States Department of Agriculture will open the 1934-35 school year the week beginning September 24. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. The tuition is $21.50 for two semesters, or $12.50 for the first semester and $9 for the second, and is payable in advance.

It is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others to see if there are enough interested to make the class self-supporting. In cases where there is a sufficient number, such courses will be offered if suitable instructors can be obtained.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School: "In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree.

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, Cornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph. D., M.A., M.S., B.A., and B.S. degrees.

Catalogues of universities and land-grant colleges are available for consultation in my office, Room 4092 - South Building.

The Department of Chemistry of the University of Maryland will offer an evening graduate course in Organic Chemistry during the school year 1934-35. This course will carry five credits per semester. The work will consist of three lecture hours and six clock hours of laboratory per week. The fee will be $10.00 per credit hour. Arrangements can be made to take the lecture work without the laboratory. For new students there will be a $10.00 matriculation fee in the Graduate School. The course will be given by Dr. N. L. Drake, Professor of Organic Chemistry. The first meeting will be held on Monday, October the first, at 6:30 P.M. in Room 107 of the Chemistry Building, at which time the schedule for the semester will be arranged. This work is a continuation of a series of evening courses offered by the Department carrying credit for the degrees of Master of Science and Doctor of Philosophy. Inquiries should be addressed to: L. B. Broughton, Head, Department of Chemistry, University of Maryland, College Park, Md.

A list of the courses to be offered will be found on the last page. Please check the course or courses you expect to take, detach the sheet, and return it promptly to Mrs. Emma M. Wolfe, Secretary and Registrar, Office of Information, U. S. Department of Agriculture, as it is especially desirable this year that we know in advance how many will enroll for each class.

Yours very truly,

A. F. Woods.

A. F. Woods,
Director of Graduate School.

GRADUATE COURSES

ECOLOGY (year).--Dr. M. B. Waite, assisted by various specialists. Monday and Thursday, beginning October 8. Room 4609, South Building.

First semester, Plant ecology, general.--The general principles of plant ecology, including the soil, climatic, and other factors influencing the principal native plant formations of the United States and the principal crop-plant regions. While special attention will be devoted to the ecology of native flowering plants, the ecology of lower forms of plant life will be considered; the ecology of cultivated crop plants will be stressed; and the local plant formations around Washington, D. C., will be given some attention. The attempt will be made to develop the viewpoint of plant ecology, methods of study, and observation, as bearing on problems in botany and phytotechny. Prerequisites, a general knowledge of botany and of agriculture.

Second semester, Ecology of plant diseases.--Dr. M. B. Waite. The attempt will be made to develop the principles of ecology as applied to plant diseases. The effect of the various ecological factors will be discussed in relation, first, to the nonparasitic diseases of plants, and second, to the virus and parasitic diseases of plants; and the ecology of insects concerned in transmitting disease will be considered. The ecology of special-type diseases and special groups of diseases, particularly diseases of fruits, but also of other horticultural and agronomic crops, will be stressed. The problems of the incidence, distribution, and epidemics of parasitic and virus diseases, as well as the factors concerned in the nonparasitic or ecological diseases, will be discussed. Prerequisites, a general knowledge of botany, phytotechny, and plant pathology, and the above first semester.

ADVANCED GENERAL CHEMISTRY, (based on the periodic system) (year).--Dr. Horace G. Byers. Monday and Wednesday, beginning September 24. Room 101, East Wing.

The course will consist of an historical development of the fundamental laws and theories of chemistry, which ultimately made possible the development of the periodic system. This system will then be made the basis for the organization of the general chemical relationships shown by the elements which have led to the development of the modern laws and theories. Especial stress will be laid upon the question of atomic structure. The work will consist of lectures, which are to be supplemented by library research by the students. The results of the library work will be reported in papers which may be presented in class. Since the organization of the details of the course will depend largely on the number of students, it will be essential that all registrations be in well in advance of the first meeting of the class.

SOILS AND FERTILIZERS (year).

First semester.--Composition of Soils. Dr. Horace G. Byers and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning September 25. Room 101, East Wing.

The course will discuss the origin of soils and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics stressed will be: Soil constitution,

soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes demonstrated will include mechanical analysis, base exchange methods, electro-dialysis, cataphoresis, and hydrogen-ion determinations. Prerequisites for the course: Graduation from an agricultural college or equivalent undergraduate work in chemistry and physics.

Second semester.--Manufacture, Theory and Use of Fertilizers, Dr. R. O. E. Davis and other members of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning after close of first semester.

This course by a number of specialists will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to the maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, methods of preparation, new developments in commercial manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning September 25. Room 509, Administration Building.

A development of the genetic principles that underlie plant-breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modify germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).--Dr. W. B. Kemp, Monday, 2 hours, beginning September 24. Room 509, Administration Building.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

ENZYME CHEMISTRY (year).--Dr. A. K. Balls. The first meeting of the class will be held Wednesday, September 26, at which time definite dates for meetings of class will be decided. Room 214, Building 216, 13th St., S. W.

First semester.--General enzyme chemistry.

Second semester.--A seminar course, studying in detail the recent important advances in this field. Students must possess a general knowledge of enzyme chemistry and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

SELECTED TOPICS IN PHYSICAL CHEMISTRY (year).--O. A. Nelson. Monday and Wednesday, beginning September 24, at 8 a. m. Room

This course deals with selected topics in theoretical chemistry, such as states of matter, chemical dynamics, solutions, theories of catalysis, atomic and molecular structure, etc. The choice of topics

as well as the order of presentation will depend to a large extent on the previous training of the students. An additional credit hour may be earned by completing a number of laboratory assignments provided by the instructor. Prerequisite, elementary physical chemistry, calculus.

AN INTRODUCTION TO ANIMAL PARASITOLOGY (one semester).--Dr. J. E. Alicata. Monday, Wednesday, and Friday, beginning September 24 (2 lectures and one laboratory period to be arranged). Room 224 East Wing, Administration Building.

The course will consist of a series of lectures and assigned reading, covering the classification, morphology, life history, and host relations of the Protozoa, Platyheiminthes, Nemathelminthes, and Arthropods affecting man and domestic animals. The laboratory work will consist in the studying and identifying the most common animal parasites. Living material will be utilized as far as practicable. The methods of collection, preservation, and preparation for examination will be emphasized. Prerequisites, two college courses in Zoology or their equivalent.

AN INTRODUCTION TO ORGANIC CHEMISTRY (year).--Dr. E. P. Clark. Monday and Thursday, beginning September 24. Room 509, 216 13th St., S. W.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

PHYSIOLOGICAL CHEMISTRY (year).--Dr. Paul E. Howe. Tuesday and Thursday, beginning September 25. Room H-337, Bldg. F.

First semester.--A course on the elementary principles of physiological chemistry will be developed with reference to the needs of the class. It will deal with the characteristics of food stuffs, the processes involved in their conversion and assimilation by the body, the characteristics of body fluids and secretions, the products of excretion and characteristics of body tissues and the process of metabolism.

Second semester.--The course will deal with selected topics relating especially to body fluids, tissues, excretions and secretions, with the consideration of physiological activity in relation to biochemical processes in chemistry. A consideration of the endocrine glands on metabolic activity.

ADVANCED ORGANIC CHEMISTRY (year).--Dr. H. L. Haller. Tuesday and Thursday, classes to be held at 8 a.m. Room 213 in 216 13th St., S.W. Beginning September 26.

The course will be devoted to a more advanced study of the compounds of carbon. Topics to be covered are the carbohydrates, proteins, fats, terpens, alkaloids, dyes, drugs, plant pigments, stereochemistry,

etc. The subject matter will be varied to suit the needs of the particular group enrolled. An elementary course in organic chemistry or its equivalent is a prerequisite.

TAXONOMIC MYCOLOGY (year).--Dr. William W. Diehl. Tuesday, September 25 (two laboratory periods of two hours, each, time to be arranged). Room 334, West Wing.

This course is planned for those persons previously equipped with a general knowledge of fungus morphology who desire an intimate acquaintance with methods and the technical literature of taxonomic mycology. Chief consideration will be given to study and identification of specimens gathered by members of the class.

COMPARATIVE NEMATOLOGY (year).--Dr. B. G. Chitwood. Wednesday and Friday, beginning September 26. Room 217-218 East Wing.

First semester.--Will be devoted to the morphology and histology of nematodes, with particular reference to the significance of such information in evolution and classification. Prerequisites, 4 college courses in zoology or the equivalent.

Second semester.--Will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the first semester. Each student will be given material to study at his convenience, and the laboratory work will coordinate with the lectures. Each student must have a microscope at his disposal.

Informal laboratories equivalent to 2 hours per week will be included, and in addition considerable work in the way of collecting and identification will be required.

ADVANCED STATISTICAL ANALYSIS (year).--Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning September 25. Room 2050, South Building.

First semester.--The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simple and multiple correlation, emphasizing the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's Introduction to the Theory of Statistics, Ezekiel's Methods of Correlation Analysis, and R. A. Fisher's Statistical Methods for Research Workers' will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second semester.--Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

ADJUSTMENT OF OBSERVATIONS (year).--Dr. W. Edwards Deming. Thursdays from 4:45 to 6:45. Room 522, Administration Bldg. First meeting Thursday, September 27.

First semester.--The course will begin with a review of the calculus,

in which emphasis will be placed on the sections most needed in the theory of errors. The following topics will then be treated: moments of areas under curves and various other figures, frequency curves and polygons, theory of Sheppard's corrections, interpolation and the calculus of finite differences, the complete and incomplete Gamma and Beta functions and the use of tables of these functions, moments of more complicated curves, the De Moivre-Stirling approximation; approximations to limits; the binomial and multinomial descriptions of frequency, Bernoulli's theorem, the meaning of maximum likelihood, Bayes' theorem and Laplace's generalization; history of the normal curve, the Tchebycheff inequality, the history and uses of the normal probability integral, the use of Tippett's random sampling numbers. Prerequisite: calculus.

Second semester.--On the basis of the normal parent population, the sampling distributions of u, s, and z and of various derived functions will be developed. These will lead to several statistical tests for the mean and standard deviation of the parent population. Charts and tables for such tests will be distributed, and the tests will be illustrated and compared with an actual set of 100 samples. Fisher's notion of fiducial values will be discussed. The estimation of the probable error of a mean by the empirical, maximum likelihood, and posterior methods will follow, together with a discussion of the fluctuations in such estimates. The estimation of the probable error from several samples will be studied. The law of the propogation of error will be developed, and will be followed by an independent derivation of the distribution of a linear function of several samples. This will lead to the u and z tests for the significance of two means. The distribution of Chi-square for curve fitting will be found, and the Chi-test and the analysis of variance will be developed for the detection of constant and systematic errors. Least squares will be studied as a process for minimizing Chi-square, after which the systematic computation and solution of normal equations will be explained. A simplified method of computing Chi-square in the same process will be discovered. There will be an introduction to the theory of fitting a power series by means of orthogonal polynomials. Prerequisite: the first semester or its equivalent.

HISTORY OF AMERICAN AGRICULTURE (year).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning September 25. Room 1040, South Building.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic coast; indigenous and foreign contributions to American agriculture; Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.--A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain

since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the policital revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester).--Tuesday and Thursday, beginning Feb. 5. Room 110, West Wing.

A composite course of thirty lectures by workers in this Department, the Bureau of Standards, and other laboratories, one or more lectures to be given by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Most of the meetings of the class will necessarily be held in laboratories where the special apparatus is installed. A list of the subject and lecturers will be given in the Final Announcement.

THEORY OF PRICES AND PRICE MAKING (year).--Mr. H. J. Wadleigh. First meeting of the class on Monday, September 24, in Room 3065, South Building, when two weekly dates will be arranged.

The course will deal with the more advanced aspects of price theory, including monetary theory, with special emphasis on recent developments and on applications to problems of social control. Students are expected to have had at least an elementary training in economic theory. A knowledge of elementary calculus will be helpful but not necessary. An outline of the course with a list of readings (subject to later revision)

will be available at the first meeting.

First semester.--A general survey of equilibrium economics and its applications to current economic problems, including the following topics: (1) The scientific method in economics; (2) The meaning of demand curves, supply curves and cost curves, of elasticity of demand and elasticity of substitution and the application of these to problems of price analysis and price fixing; (3) The distinction between long-run and short-run price determination; (4) The theory of interest, profits and technical change in relation to economic growth in the capitalist system.

Second semester.--Discussion of some recent developments of economic theory with special reference to: (1) The theory of monopoly and its recent extension to problems of price and wage determination under conditions of imperfect competition in our present economic system; (2) The theory of marginal productivity and the distribution of income; (3) equilibrium economics in relation to monetary and business cycle theory.

No textbook will be used in this course; readings will include, among other things, selections from the following books: Black, Production Economics; Marshall, Principles of Economics; Knight, Risk, Uncertainty and Profit; Taylor, Principles of Economics; Wicksell, Lectures on Political Economy; Robinson, Economics of Imperfect Competition; Keynes, A Treatise on Money. They will also include articles in periodicals by the following authors, among others: Jacob Viner, F. H. Knight, E. J. Working, R. F. Harrod, Simon Vusnetz.

HISTORY OF ECONOMIC THOUGHT (year).--Dr. Max J. Wasserman. Monday and Wednesday, beginning September 24. Room

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresme. The Mercantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Riviere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill: The Solialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Kneis, Hillebrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics -- Veblen, Pigou, J. M. Clark, J. R. Commons, R. G. Tugwell.

INFLATION IN THEORY AND PRACTICE (year).--Dr. Max J. Wasserman. Tuesday and Thursday, beginning September 25. Room

This course will examine and analyze the theory and practice of inflation with special reference to the European post-war inflations and the present-day monetary devaluation and inflation programs. It will begin with a brief resumé of the most important inflation periods in history, such as the Mercantilist inflation of 1500-1750, the Restriction Period of the Bank of England 1798-1819, American colonial paper money inflation, the greenbacks, and the free silver movement. The course will then take up an intensive study of the post-war inflations

in Europe and of the present inflationary programs. The lecture material will present, among other things, the results of a recent field investigation made in Europe of the economic and social effects of inflation, special emphasis being placed on the quantitative aspects. An attempt will be made to evaluate the current theories of inflation, and to construct new theories in the light of recent developments and investigations.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning September 24. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Monday and Wednesday, beginning September 24. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower will be studied. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

ELEMENTS OF ECONOMICS (year).--Dr. L. Volin, Tuesday, September 25, at 5 P.M., at which meeting two days a week will be decided on for holding the class. Room 3907, South Building.

This will be an introductory course in economic principles and institutions. It will aim to give a picture of the modern economic society, its organization and functioning and to serve as a foundation for more advanced and specialized study of economics. Among the subjects treated will be: Value and price determination; money and credit; business cycle and the price level; distribution of income, taxation, types of business organization in industry and agriculture; international trade and commercial policies; the labor problem; public control of economic activity and proposals of economic reform.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (year).--M. S. Eisenhower and staff. Tuesday and Thursday, beginning September 25. Room 302, Administration Building.

Students will be required to prepare interpretive articles for magazines and newspapers, as well as interpretive addresses for radio broadcasting. The course will be built around actual practice in writing interpretive material. Each student will have the privilege of preparing articles or addresses on subjects of his own selection. These will be used as a basis for class discussions. The main purpose will be to aid each student select significant subjects for articles or addresses, organize the material properly, present it in a way that it will appeal to the readers of specific journals or to radio listeners, and finally, edit the material for effectiveness in style. Criticisms will be made by both instructors and students. Addresses will be broadcast on the Department's practice equipment and criticisms will be offered on the basis of auditions rather than on critical readings. The enrollment for this course is limited to 15 students, to permit the instructors to give individual attention to the writings of each student. However, a minimum of 8 is required.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester).--Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning September 24. Room 522, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY STATISTICAL METHODS (year).--B. R. Stauber and F. J. Hosking. Monday and Wednesday, beginning September 24. Room 2050, South Building.

First semester.--This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers and the analysis of time series data.

Second semester.--This will be a continuation of the first semester,

and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and multiple linear correlation.

SCIENTIFIC FRENCH (year).--Dr. H. B. Humphrey. Monday and Wednesday, beginning September 24. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Joursier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning September 25. Room 213-215, West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY RUSSIAN (year).--Dr. C. H. Leineweber. Wednesday and Friday (suitable dates will be arranged with the class), beginning September 26. Room 223-224, East Wing, Administration Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Method.

ADVANCED RUSSIAN (year).--Dr. C. H. Leineweber. Tuesday and Thursday, beginning September 25. Room 223-224, East Wing, Administrative Building.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

ELEMENTARY SPANISH (year).--Henry R. Bartmann. Tuesday and Thursday, beginning September 25, at 5 p.m. Room 4092, South Building.

The course consists of 2 lessons per week in higher Grammar. Prerequisite, one semester of Spanish Grammar.

ADVANCED SPANISH (year).--Henry R. Bartmann. Wednesday and Friday, beginning September 26, at 5 p.m. Room 4092, South Building.

This course consists of one lesson per week in higher Grammar and one lesson in reading Spanish text. Prerequisites, two semesters of elementary Spanish.

BEGINNER'S SPANISH (year).--Henry R. Bartmann. The meeting to organize this class and determine dates of holding classes will be Monday, September 17 at 5 p.m. Room 4092, South Building.

ELEMENTARY DUTCH (year).--Dr. Emile Simon. Beginning Tuesday, September 25, at which meeting dates for the class will be fixed. Room 4090, South Building.

First semester.--This is designed to master the elements of Dutch Grammar.

Second semester.--Continuation, with special emphasis on translation.

THE LIBRARY, ITS ORGANIZATION AND USE (one semester).--Miss Claribel Barnett assisted by library specialists. Tuesday and Thursday, beginning January 25, Room 0039, South Building.

A description of the library classification and the library card catalogue; descriptions of the various special indexes maintained by the main library and the Bureau libraries; the current bibliographical lists issued by the library and something about the more important printed catalogues, bibliographies, abstract journals, and indexes of special interest in the Department's work; procedure and policies in the acquisition of material for the library; something about rules and procedure in the circulation of books and periodicals, reference service, and inter-library loan privileges, particularly with the library of Congress and other Government libraries.

PHOTOGRAPHY (one semester).--Mr. C. H. Hanson and other specialists. Two periods a week beginning Monday, February 18, 1935. Room

In 1933 a course on the Principles of Photography was offered by Dr. Carroll of the Bureau of Standards. The course emphasized the physical and chemical aspects of the subject matter.

We plan to offer during the second semester of 1934-35, a course on the more practical aspects of the subject, presented by the best obtainable practical experts in each field. The course will include demonstrations of methods and equipment; photographic lenses and how to use them; cameras and accessories; photographic apparatus and materials; plates and films; photographic rendering of color values in monochrome; exposure; the camera in use, selection and arrangement of the subject; how to tell a story by photography; developing negatives; printing; photographing of buildings, structures and implements; Agronomical subjects; plants, flowers and vegetables; insects and small objects; livestock; photography with artificial light; interiors; pathological materials; color photography; line work and copying; photomicrography; infra-red photography; photographs for film strips and publication; filing.

We urgently request that workers having special photographic problems or other aspects of the subject that may be desired, call them to the attention of the Director so that the course may be made as helpful as possible. As far as time permits each student will have opportunity to confer with specialists on his or her photographic problems.

Dr. A. F. Woods,
Director of Graduate School.

Dear Doctor Woods:

I expect to take the course or courses checked in the following list:

GRADUATE COURSES

(1) Ecology
(2) Advanced General Chemistry
(3) Soils and Fertilizers
(4) Plant Genetics
(5) Advanced Statistics for Biological Workers
(6) Enzyme Chemistry
(7) Selected Topics in Physical Chemistry
(8) Introduction to Animal Parasitology
(9) Introduction to Organic Chemistry
(10) Physiological Chemistry
(11) Advanced Organic Chemistry
(12) Taxonomic Mycology
(13) Comparative Nematology
(14) Advanced Statistical Analysis
(15) Adjustment of Observations
(16) History of American Agriculture
(17) Scientific Instruments and Their Use
(18) Theory of Prices and Price Making
(19) History of Economic Thought
(20) Inflation in Theory and Practice

UNDERGRADUATE COURSES

(21) Glass Blowing
(22) Systematic Botany
(23) Elements of Economics
(24) Interpreting Agriculture, and Home Economics
(25) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(26) Elementary Statistical Methods
(27) Scientific French
(28) Intermediate Scientific German
(29) Elementary Russian
(30) Advanced Russian

(31) Elementary Spanish
(32) Advanced Spanish
(33) Beginner's Spanish
(34) Elementary Dutch
(35) The Library, its Organization and Use
(36) Photography

If given I would also take a course in .....

.....

Name.....

Address.....

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

August 29

1934

In addition to the courses mentioned in the Preliminary Announcement of the Graduate School the following courses will be offered:

GRADUATE COURSES

PLANT ANATOMY (year).--Dr. Ernst Artschwager. Saturdays 1.30 - 4.30. Room 401, West Wing.

This course is designated to give a working acquaintance with the internal morphology of vascular plants and emphasis is placed on practice in interpretation and determination of material. There is available for study a large selection of prepared slides, but each student will also be required to workout the anatomy and ontogeny of a given plant which will include: fixing of the material, embedding, sectioning, staining and preparation of photomicrographs. In order to facilitate the work there will be at the beginning of the course practical demonstrations in important laboratory technique.

UNDERGRADUATE COURSES

PATENT LAW FOR SCIENTIFIC RESEARCH WORKERS (year).-- Dr. Joseph Rossman of the U. S. Patent Office. Wednesday and Friday, beginning September 26. Room _____ (to be arranged later).

This course is intended especially for research workers in government laboratories and bureaus who may develop new methods, apparatus, products and certain types of living plants and to give them a practical working knowledge and background of their legal rights, remedies and procedure.

In the first semester the fundamental principles of patent law will be covered, including a study of the basic patent laws, the types of physical, chemical, and biological discoveries or inventions which can be patented, the different legal tests for determining patentable invention and novelty, the rights under patents, particularly in regard to government employees, infringement, licenses, royalties, etc. Special attention will be given to the new plant patent law under which certain types of living plants may be patented. The procedure in preparing and prosecuting patent applications will also be taken up.

In the second semester further details of patent prosecution will be studied such as amendments, interferences, appeals, disclaimers, and reissues. Special patent problems in the fields of drugs and medicines, bacteriology, foods and metallurgy will be discussed and illustrated with actual cases. Some attention will also be given to the commercialization of inventions. The patent policies of universities, institutions and commercial organizations will also be surveyed.

INTERPRETING ACCOUNTING RECORDS AND REPORTS (year).--W. H. Rowe. Tuesday and Thursday, beginning September 25. Room _____. (to be arranged later).

This course will cover the general accounting principles necessary for an understanding of accounting records and reports and the processes by which they are prepared. Emphasis will be placed upon a study of the general ledger accounts, the balance sheet, the statement of profit and loss, the other sources of data used for statistical analysis or regulation. Treatment of depreciation as it relates to income, profits, and cash balances will be covered. Corporation accounts such as capital stock, surplus, reserves, etc., will be treated. The general principles of finding costs of production will also be taken up especially as they relate to costs of producing farm products. The work will proceed by lectures, discussions, and problems. No formal bookkeeping will be required.

If you expect to take any of these courses listed, please notify Mrs. Emma M. Wolfe, Secretary and Registrar, 540 Administration Building, Office of Information, U. S. Department of Agriculture, as it is especially desirable this year that we know in advance how many will enroll for each class.

Yours very truly,

A. F. Woods,
Director of Graduate School.

P.S.: Here is another course, Graduate School Credit.

ADVANCED PHYSICAL CHEMISTRY. (year).--Prof. Malcolm Haring of the University of Maryland. Three hours per week, Monday, Wednesday, and Friday, beginning September 24. Room_____ (To be arranged later).

This course aims to furnish the student with a thorough background in the laws and theories of chemistry. (The gas laws, kinetic theory, liquids, solutions, elementary thermodynamics, thermochemistry, equilibrium, chemical kinetics, etc., will be discussed.)

For graduate credit, this course must be followed by two laboratory period per week or its equivalent.

Students registering must have quantitative and qualitative analysis, general chemistry, general physics, and calculus, and plain analytic geometry, prerequisite.

The course will not be given unless there are at least 12 students registered.

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UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

September 18

1934

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U.S. DEPARTMENT OF AGRICULTURE

In addition to the courses mentioned in the Final Announcement of the Graduate School the following courses will be offered:

UNDERGRADUATE COURSES

ELEMENTARY STATISTICAL METHODS (Second semester of course begun in February, 1934).--B. R. Stauber and F. J. Hosking. Tuesday and Thursday, beginning September 25, Room 5037, South Building.

Second semester.--This will be a continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and multiple linear correlation.

PATENT LAW FOR SCIENTIFIC RESEARCH WORKERS (year).--Dr. Joseph Rossman of the U. S. Patent Office. Wednesday and Friday, beginning September 26. Room 5075, South Building.

This course is intended especially for research workers in government laboratories and bureaus who may develop new methods, apparatus, products and certain types of living plants and to give them a practical working knowledge and background of their legal rights, remedies and procedure.

In the first semester the fundamental principles of patent law will be covered, including a study of the basic patent laws, the types of physical, chemical, and biological discoveries or inventions which can be patented, the different legal tests for determining patentable invention and novelty, the rights under patents, particularly in regard to government employees, infringement, licenses, royalties, etc. Special attention will be given to the new plant patent law under which certain types of living plants may be patented. The procedure in preparing and prosecuting patent applications will also be taken up.

In the second semester further details of patent prosecution will be studied such as amendments, interferences, appeals, disclaimers, and reissues. Special patent problems in the fields of drugs and medicines, bacteriology, foods, and metallurgy will be discussed and illustrated with actual cases. Some attention will also be given to the commercialization of inventions. The patent policies of universities, institutions and commercial organizations will also be surveyed.

If you expect to take either of these courses listed, please notify Mrs. Emma M. Wolfe, Secretary and Registrar, 540 Administration Building, Office of Information, U. S. Department of Agriculture, as it is especially desirable this year that we know in advance how many will enroll for each class.

Yours very truly,

A. F. Woods,
Director of Graduate School.

ISS LACY.

GRADUATE SCHOOL

U. S. DEPARTMENT OF AGRICULTURE

Dr. C. G. Abbott, Secretary, Smithsonian Institution, invites those in the Department of Agriculture, who are interested, to attend a lecture by Dr. Ales Hrdlicka, Curator of Physical Anthropology, U. S. National Museum, to be given in the hall of the National Museum, 10th and Constitution Avenue, at 8:15 p.m. on Wednesday, November 7. His subject will be "New Light on the Peopling and Cultural Developments of the Far North". The lecture will cover Dr. Hrdlicka's work in Alaska during the past summer. It will be a popular talk rather than a technical lecture. Please call this to the attention of those in your Bureau who are interested.

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A. F. Woods
Director of the Graduate School.

October 17, 1934.

DEPARTMENT OF AGRICULTURE
WASHINGTON

GRADUATE SCHOOL

September 13, 1935

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DEPARTMENT OF AGRICULTURE

Memorandum to those desiring to register for advanced courses in Personnel Administration.

I am enclosing herewith further information as it has been developed in cooperation with the American University, School of Public Affairs relative to advanced work in Personnel Administration. If you are already registered in the Graduate School as having taken the preliminary course, you may complete your registration by filling out the blank enclosed herewith and forwarding it to this office with the necessary fee or to the Office of American University, School of Public Affairs.

If you have not previously registered, you must appear in person either at this office or the office of the American University and register. It is desirable to attend to this at once as we must know the number to provide for.

Very truly yours,

A. F. Woods
Director, Graduate School

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UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

September 15

1934

F I N A L A N N O U N C E M E N T

The Graduate School of the United States Department of Agriculture will open the 1934-35 school year the week beginning September 24. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. The tuition is $21.50 for two semesters, or $12.50 for the first semester and $9 for the second, and is payable in advance.

It is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others to see if there are enough interested to make the class self-supporting. In cases where there is a sufficient number, such courses will be offered if suitable instructors can be obtained.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School: "In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them. Graduate work in these departmental courses is accepted by a number of the standard universities as credit toward a higher degree.

A number of our students have filed certificates, which we issue on request, with various universities, for example, the Universities of Maryland, Minnesota, Ohio, Wisconsin, Washington, Cornell, George Washington, American, Johns Hopkins, Yale, Chicago, and Harvard, and received credit toward the Ph. D., M.A., M.S., B.A., and B.S. degrees.

Catalogues of universities and land-grant colleges are available for consultation in my office, Room 4092 - South Building.

The Department of Chemistry of the University of Maryland will offer an evening graduate course in Organic Chemistry during the school year 1934-35. This course will carry five credits per semester. The work will consist of three lecture hours and six clock hours of laboratory per week. The fee will be $10.00 per credit hour. Arrangements can be made to take the lecture work without the laboratory. For new students there will be a $10.00 matriculation fee in the Graduate School. The course will be given by Dr. N. L. Drake, Professor of Organic Chemistry. The first meeting will be held on Monday, October the first, at 6:30 P.M. in Room 107 of the Chemistry Building, at which time the schedule for the semester will be arranged. This work is a continuation of a series of evening courses offered by the Department carrying credit for the degrees of Master of Science and Doctor of Philosophy. Inquiries should be addressed to: L. B. Broughton, Head, Department of Chemistry, University of Maryland, College Park, Md.

A list of the courses to be offered will be found on the last page. Please check the course or courses you expect to take, detach the sheet, and return it promptly to Mrs. Emma M. Wolfe, Secretary and Registrar, Office of Information, U. S. Department of Agriculture, as it is especially desirable this year that we know in advance how many will enroll for each class.

Yours very truly,

A. F. Woods.

A. F. Woods,
Director of Graduate School.

GRADUATE COURSES

ECOLOGY (year).--Dr. M. B. Waite, assisted by various specialists. Monday and Thursday, beginning October 8. Room 4609, South Building.

First semester, Plant ecology, general.--The general principles of plant ecology, including the soil, climatic, and other factors influencing the principal native plant formations of the United States and the principal crop-plant regions. While special attention will be devoted to the ecology of native flowering plants, the ecology of lower forms of plant life will be considered; the ecology of cultivated crop plants will be stressed; and the local plant formations around Washington, D. C., will be given some attention. The attempt will be made to develop the viewpoint of plant ecology, methods of study, and observation, as bearing on problems in botany and phytotechny. Prerequisites, a general knowledge of botany and of agriculture.

Second semester, Ecology of plant diseases.--Dr. M. B. Waite. The attempt will be made to develop the principles of ecology as applied to plant diseases. The effect of the various ecological factors will be discussed in relation, first, to the nonparasitic diseases of plants, and second, to the virus and parasitic diseases of plants; and the ecology of insects concerned in transmitting disease will be considered. The ecology of special-type diseases and special groups of diseases, particularly diseases of fruits, but also of other horticultural and agronomic crops, will be stressed. The problems of the incidence, distribution, and epidemics of parasitic and virus diseases, as well as the factors concerned in the nonparasitic or ecological diseases, will be discussed. Prerequisites, a general knowledge of botany, phytotechny, and plant pathology, and the above first semester.

ADVANCED GENERAL CHEMISTRY, (based on the periodic system) (year).--Dr. Horace G. Byers. Monday and Wednesday, beginning September 24. Room 101, East Wing.

The course will consist of an historical development of the fundamental laws and theories of chemistry, which ultimately made possible the development of the periodic system. This system will then be made the basis for the organization of the general chemical relationships shown by the elements which have led to the development of the modern laws and theories. Especial stress will be laid upon the question of atomic structure. The work will consist of lectures, which are to be supplemented by library research by the students. The results of the library work will be reported in papers which may be presented in class. Since the organization of the details of the course will depend largely on the number of students, it will be essential that all registrations be in well in advance of the first meeting of the class.

SOILS AND FERTILIZERS (year).

First semester.--Composition of Soils. Dr. Horace G. Byers and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning September 25. Room 101, East Wing.

The course will discuss the origin of soils and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics stressed will be: Soil constitution,

soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes demonstrated will include mechanical analysis, base exchange methods, electro-dialysis, cataphoresis, and hydrogen-ion determinations. Prerequisites for the course: Graduation from an agricultural college or equivalent undergraduate work in chemistry and physics.

Second semester.--Manufacture, Theory and Use of Fertilizers, Dr. R. O. E. Davis and other members of the Bureau of Chemistry and Soils. Tuesday and Friday, beginning after close of first semester.

This course by a number of specialists will present a coherent treatment of the subject. It will cover different phases of fertilizer manufacture and use, and the relation of fertilizers to the maintenance of soil fertility. It will consider the development of commercial fertilizers, sources of materials, methods of preparation, new developments in commercial manufacture and chemical processes involved, functions of fertilizer elements in plant growth, principles of use, factors affecting efficiency, methods of testing, and economic relations. Prerequisite of the course is a course in general chemistry.

PLANT GENETICS (one semester).--Dr. W. B. Kemp. Tuesday and Friday, beginning September 25. Room 509, Administration Building.

A development of the genetic principles that underlie plant-breeding practice, including independent inheritance, linkage, chromosome mapping, hybrid vigor, mutations, effects of selection, efforts to modify germplasm and to direct such modifications.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year).--Dr. W. B. Kemp, Monday, 2 hours, beginning September 24. Room 509, Administration Building.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

ENZYME CHEMISTRY (year).--Dr. A. K. Balls. The first meeting of the class will be held Wednesday, September 26, at which time definite dates for meetings of class will be decided. Room 214, Building 216, 13th St., S. W.

First semester.--General enzyme chemistry.

Second semester.--A seminar course, studying in detail the recent important advances in this field. Students must possess a general knowledge of enzyme chemistry and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

SELECTED TOPICS IN PHYSICAL CHEMISTRY (year).--O. A. Nelson. Monday and Wednesday, beginning September 24, at 8 a. m. Room

This course deals with selected topics in theoretical chemistry, such as states of matter, chemical dynamics, solutions, theories of catalysis, atomic and molecular structure, etc. The choice of topics

as well as the order of presentation will depend to a large extent on the previous training of the students. An additional credit hour may be earned by completing a number of laboratory assignments provided by the instructor. Prerequisite, elementary physical chemistry, calculus.

AN INTRODUCTION TO ANIMAL PARASITOLOGY (one semester).--Dr. J. E. Alicata. Monday, Wednesday, and Friday, beginning September 24 (2 lectures and one laboratory period to be arranged). Room 224 East Wing, Administration Building.

The course will consist of a series of lectures and assigned reading, covering the classification, morphology, life history, and host relations of the Protozoa, Platyheiminthes, Nemathelminthes, and Arthropods affecting man and domestic animals. The laboratory work will consist in the studying and identifying the most common animal parasites. Living material will be utilized as far as practicable. The methods of collection, preservation, and preparation for examination will be emphasized. Prerequisites, two college courses in Zoology or their equivalent.

AN INTRODUCTION TO ORGANIC CHEMISTRY (year).--Dr. E. P. Clark. Monday and Thursday, beginning September 24. Room 509, 216 13th St., S. W.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

PHYSIOLOGICAL CHEMISTRY (year).--Dr. Paul E. Howe. Tuesday and Thursday, beginning September 25. Room H-337, Bldg. F.

First semester.--A course on the elementary principles of physiological chemistry will be developed with reference to the needs of the class. It will deal with the characteristics of food stuffs, the processes involved in their conversion and assimilation by the body, the characteristics of body fluids and secretions, the products of excretion and characteristics of body tissues and the process of metabolism.

Second semester.--The course will deal with selected topics relating especially to body fluids, tissues, excretions and secretions, with the consideration of physiological activity in relation to biochemical processes in chemistry. A consideration of the endocrine glands on metabolic activity.

ADVANCED ORGANIC CHEMISTRY (year).--Dr. H. L. Haller. Tuesday and Thursday, classes to be held at 8 a.m. Room 213 in 216 13th St., S.W. Beginning September 26.

The course will be devoted to a more advanced study of the compounds of carbon. Topics to be covered are the carbohydrates, proteins, fats, terpens, alkaloids, dyes, drugs, plant pigments, stereochemistry,

etc. The subject matter will be varied to suit the needs of the particular group enrolled. An elementary course in organic chemistry or its equivalent is a prerequisite.

TAXONOMIC MYCOLOGY (year).--Dr. William W. Diehl. Tuesday, September 25 (two laboratory periods of two hours, each, time to be arranged). Room 334, West Wing.

This course is planned for those persons previously equipped with a general knowledge of fungus morphology who desire an intimate acquaintance with methods and the technical literature of taxonomic mycology. Chief consideration will be given to study and identification of specimens gathered by members of the class.

COMPARATIVE NEMATOLOGY (year).--Dr. B. G. Chitwood. Wednesday and Friday, beginning September 26. Room 217-218 East Wing.

First semester.--Will be devoted to the morphology and histology of nematodes, with particular reference to the significance of such information in evolution and classification. Prerequisites, 4 college courses in zoology or the equivalent.

Second semester.--Will be devoted to embryology, larval development, and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief. Prerequisite, the first semester. Each student will be given material to study at his convenience, and the laboratory work will coordinate with the lectures. Each student must have a microscope at his disposal.

Informal laboratories equivalent to 2 hours per week will be included, and in addition considerable work in the way of collecting and identification will be required.

ADVANCED STATISTICAL ANALYSIS (year).--Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning September 25. Room 2050, South Building.

First semester.--The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simple and multiple correlation, emphasizing the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's Introduction to the Theory of Statistics, Ezekiel's Methods of Correlation Analysis, and R. A. Fisher's Statistical Methods for Research Workers' will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second semester.--Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

ADJUSTMENT OF OBSERVATIONS (year).--Dr. W. Edwards Deming. Thursdays from 4:45 to 6:45. Room 522, Administration Bldg. First meeting Thursday, September 27.

First semester.--The course will begin with a review of the calculus,

in which emphasis will be placed on the sections most needed in the theory of errors. The following topics will then be treated: moments of areas under curves and various other figures, frequency curves and polygons, theory of Sheppard's corrections, interpolation and the calculus of finite differences, the complete and incomplete Gamma and Beta functions and the use of tables of these functions, moments of more complicated curves, the De Moivre-Stirling approximation; approximations to limits; the binomial and multinomial descriptions of frequency, Bernoulli's theorem, the meaning of maximum likelihood, Bayes' theorem and Laplace's generalization; history of the normal curve, the Tchebycheff inequality, the history and uses of the normal probability integral, the use of Tippett's random sampling numbers. Prerequisite: calculus.

Second semester.--On the basis of the normal parent population, the sampling distributions of u, s, and z and of various derived functions will be developed. These will lead to several statistical tests for the mean and standard deviation of the parent population. Charts and tables for such tests will be distributed, and the tests will be illustrated and compared with an actual set of 100 samples. Fisher's notion of fiducial values will be discussed. The estimation of the probable error of a mean by the empirical, maximum likelihood, and posterior methods will follow, together with a discussion of the fluctuations in such estimates. The estimation of the probable error from several samples will be studied. The law of the propogation of error will be developed, and will be followed by an independent derivation of the distribution of a linear function of several samples. This will lead to the u and z tests for the significance of two means. The distribution of Chi-square for curve fitting will be found, and the Chi-test and the analysis of variance will be developed for the detection of constant and systematic errors. Least squares will be studied as a process for minimizing Chi-square, after which the systematic computation and solution of normal equations will be explained. A simplified method of computing Chi-square in the same process will be discovered. There will be an introduction to the theory of fitting a power series by means of orthogonal polynomials. Rrerequisite: the first semester or its equivalent.

HISTORY OF AMERICAN AGRICULTURE (year).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning September 25. Room 1040, South Building.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic coast; indigenous and foreign contributions to American agriculture; Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.--A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain

since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester).--Tuesday and Thursday, beginning Feb. 5. Room 110, West Wing.

A composite course of thirty lectures by workers in this Department, the Bureau of Standards, and other laboratories, one or more lectures to be given by each instructor. The course will deal with the design, principles, manipulation, and field of use of a selected number of important instruments, especially those in which new technique has been developed which may be applied in the solution of biological or other problems. Most of the meetings of the class will necessarily be held in laboratories where the special apparatus is installed. A list of the subject and lecturers will be given in the Final Announcement.

RECENT DEVELOPMENTS IN ECONOMIC THEORY (year).--Mr. H. J. Wadleigh. First meeting of the class on Monday, September 24, in Room 3065, South Building, when two weekly dates will be arranged. The instructor may be consulted in Room 5092, South Building.

This course was given last year under the title "Theory of Prices and Price Making" and so described in the preliminary announcement. It is a general survey of economic theory which is concerned with the way in which the price-system is determined by and in turn influences general economic and social conditions. Particular emphasis is given to the results of the work of economic theorists during the past five or ten years, to which the second semester will be mainly devoted. The work of the first semester will deal with the fundamentals of the science which are necessary to an understanding of more recent results. Applications to present-day problems of social control will also be considered. Students should have at least an elementary knowledge of economic theory. Knowledge of elementary calculus will be helpful but not necessary. An outline of the course with a list of headings (subject to later revision) will be available at the first meeting.

First semester.--A general survey of equilibrium theory in economics with a critical discussion of the assumptions and methods on which it is based and the problems to which it is applicable. Particular attention will be given to: (1) the meaning and uses of such concepts as demand curves, supply curves, cost curves, marginal productivity, elasticity of demand, elasticity of substitution, etc.; (2) The equilibrium of prices, production and consumption under short run conditions; (3) The theory of interest and profits in relation to technical changes and economic growth.

Second Semester.--Recent developments in economic theory, including: (1) The theory of imperfect competition, with applications to price and wage determination, the distribution of resources between industries, unemployment and the distribution of income; (2) Some recent developments in monetary and business cycle theory; (3) Theory of international trade and recent developments in the theory of international payments.

No textbook will be used in this course; readings will include, among other things, selections from the following books: Black, Production Economics; Marshall, Principles of Economics; Knight, Risk, Uncertainty and Profit; Taylor, Principles of Economics; Wicksell, Lectures on Political Economy; Robinson, Economics of Imperfect Competition; Keynes, A Treatise on Money; Harrod, International Economics. They will also include articles in periodicals by the following authors, among others: Jacob Viner, F. H. Knight, E. J. Working, R. F. Harrod, Simon Kuznets.

HISTORY OF ECONOMIC THOUGHT (year).--Dr. Max J. Wasserman. Monday and Wednesday, beginning September 24. Room 5942 South Building.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresme. The Mercantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Riviere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill: The Socialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Kneis, Hillegrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics -- Veblen, Pigou, J. M. Clark, J. R. Commons, R. G. Tugwell.

INFLATION IN THEORY AND PRACTICE (year).--Dr. Max J. Wasserman. Tuesday and Thursday, beginning September 25. Room 5942 South Building.

This course will examine and analyze the theory and practice of inflation with special reference to the European post-war inflations and the present-day monetary devaluation and inflation programs. It will begin with a brief resumé of the most important inflation periods in history, such as the Mercantilist inflation of 1500-1750, the Restriction Period of the Bank of England 1798-1819, American colonial paper money inflation, the greenbacks, and the free silver movement. The course will then take up an intensive study of the post-war inflations

in Europe and of the present inflationary programs. The lecture material will present, among other things, the results of a recent field investigation made in Europe of the economic and social effects of inflation, special emphasis being placed on the quantitative aspects. An attempt will be made to evaluate the current theories of inflation, and to construct new theories in the light of recent developments and investigations.

PLANT ANATOMY (year).--Dr. Ernst Artschwager. Saturdays 1.30 - 4.30. Room 401, West Wing.

This course is designated to give a working acquaintance with the internal morphology of vascular plants and emphasis is placed on practice in interpretation and determination of material. There is available for study a large selection of prepared slides, but each student will also be required to workout the anatomy and ontogeny of a given plant which will include: fixing of the material, embedding, sectioning, staining and preparation of photomicrographs. In order to facilitate the work there will be at the beginning of the course practical demonstrations in important laboratory technique.

ADVANCED PHYSICAL CHEMISTRY. (year).--Prof. Malcolm Haring of the University of Maryland. Three hours per week, Monday, Wednesday, and Friday, beginning September 24. Room 232, West Wing.

This course aims to furnish the student with a thorough background in the laws and theories of chemistry. (The gas laws, kinetic theory, liquids, solutions, elementary thermodynamics, thermochemistry, equilibrium, chemical kinetics, etc., will be discussed.)

Students registering should have had quantitative analysis, general physics, and calculus, as prerequisites. Those with fewer prerequisites should consult the instructor.

The course will not be given unless there are at least 12 students registered.

U N D E R G R A D U A T E C O U R S E S

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning September 24. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Monday and Wednesday, beginning September 24. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower will be studied. The principles of botanical nomenclature will be discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

ELEMENTS OF ECONOMICS (year).--Dr. L. Volin, Tuesday, September 25, at 5 P.M., at which meeting two days a week will be decided on for holding the class. Room 3907, South Building.

This will be an introductory course in economic principles and institutions. It will aim to give a picture of the modern economic society, its organization and functioning and to serve as a foundation for more advanced and specialized study of economics. Among the subjects treated will be: Value and price determination; money and credit; business cycle and the price level; distribution of income, taxation, types of business organization in industry and agriculture; international trade and commercial policies; the labor problem; public control of economic activity and proposals of economic reform.

INTERPRETING AGRICULTURE AND HOME ECONOMICS (year).--M. S. Eisenhower and staff. Tuesday and Thursday, beginning September 25. Room 302, Administration Building.

Students will be required to prepare interpretive articles for magazines and newspapers, as well as interpretive addresses for radio broadcasting. The course will be built around actual practice in writing interpretive material. Each student will have the privilege of preparing articles or addresses on subjects of his own selection. These will be used as a basis for class discussions. The main purpose will be to aid each student select significant subjects for articles or addresses, organize the material properly, present it in a way that it will appeal to the readers of specific journals or to radio listeners, and finally, edit the material for effectiveness in style. Criticisms will be made by both instructors and students. Addresses will be broadcast on the Department's practice equipment and criticisms will be offered on the basis of auditions rather than on critical readings. The enrollment for this course is limited to 15 students, to permit the instructors to give individual attention to the writings of each student. However, a minimum of 8 is required.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester).--Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning September 24. Room 522, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY STATISTICAL METHODS (year).--B. R. Stauber and F. J. Hosking. Monday and Wednesday, beginning September 24. Room 2050, South Building.

First semester.--This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers and the analysis of time series data.

Second semester.--This will be a continuation of the first semester,

and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and multiple linear correlation.

SCIENTIFIC FRENCH (year).--Dr. H. B. Humphrey. Monday and Wednesday, beginning September 24. Room 106, West Wing.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Joursier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Charles Drechsler. Tuesday and Thursday, beginning September 25. Room 213-215, West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY RUSSIAN (year).--Dr. C. H. Leineweber. Wednesday and Friday (suitable dates will be arranged with the class), beginning September 26. Room 223-224, East Wing, Administration Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Method.

ADVANCED RUSSIAN (year).--Dr. C. H. Leineweber. Tuesday and Thursday, beginning September 25. Room 223-224, East Wing, Administrative Building.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

ELEMENTARY SPANISH (year).--Henry R. Bartmann. Tuesday and Thursday, beginning September 25, at 5 p.m. Room 4092, South Building.

The course consists of 2 lessons per week in higher Grammar. Prerequisite, one semester of Spanish Grammar.

ADVANCED SPANISH (year).--Henry R. Bartmann. Wednesday and Friday, beginning September 26, at 5 p.m. Room 4092, South Building.

This course consists of one lesson per week in higher Grammar and one lesson in reading Spanish text. Prerequisites, two semesters of elementary Spanish.

BEGINNER'S SPANISH (year).--Henry R. Bartmann. The meeting to organize this class and determine dates of holding classes will be Monday, September 17, at 5 p.m. Room 4092, South Building.

ELEMENTARY DUTCH (year).--Dr. Emile Simon. Beginning Tuesday, September 25, at which meeting dates for the class will be fixed. Room 4090, South Building.

First semester.--This is designed to master the elements of Dutch Grammar.

Second semester.--Continuation, with special emphasis on translation.

THE LIBRARY, ITS ORGANIZATION AND USE (one semester).--Miss Claribel Barnett assisted by library specialists. Tuesday and Thursday, beginning January 25, Room 0039, South Building.

A description of the library classification and the library card catalogue; descriptions of the various special indexes maintained by the main library and the Bureau libraries; the current bibliographical lists issued by the library and something about the more important printed catalogues, bibliographies, abstract journals, and indexes of special interest in the Department's work; procedure and policies in the acquisition of material for the library; something about rules and procedure in the circulation of books and periodicals, reference service, and inter-library loan privileges, particularly with the library of Congress and other Government libraries. There will be no charge for this course.

PHOTOGRAPHY (one semester).--Mr. C. H. Hanson and other specialists. Two periods a week beginning Monday, February 18, 1935. Room 4415 South Building.

In 1933 a course on the Principles of Photography was offered by Dr. Carroll of the Bureau of Standards. The course emphasized the physical and chemical aspects of the subject matter.

We plan to offer during the second semester of 1934-35, a course on the more practical aspects of the subject, presented by the best obtainable practical experts in each field. The course will include demonstrations of methods and equipment; photographic lenses and how to use them; cameras and accessories; photographic apparatus and materials; plates and films; photographic rendering of color values in monochrome; exposure; the camera in use, selection and arrangement of the subject; how to tell a story by photography; developing negatives; printing; photographing of buildings, structures and implements; Agronomical subjects; plants, flowers and vegetables; insects and small objects; livestock; photography with artificial light; interiors; pathological materials; color photography; line work and copying; photomicrography; infra-red photography; photographs for film strips and publication; filing.

We urgently request that workers having special photographic problems or other aspects of the subject that may be desired, call them to the attention of the Director so that the course may be made as helpful as possible. As far as time permits each student will have opportunity to confer with specialists on his or her photographic problems.

INTERPRETING ACCOUNTING RECORDS AND REPORTS (year).--W. H. Rowe. Tuesday and Thursday, beginning September 25. Room 2526-28, South Building.

This course will cover the general accounting principles necessary for an understanding of accounting records and reports and the processes by which they are prepared. Emphasis will be placed upon a study of the general ledger accounts, the balance sheet, the statement of profit and loss, the other sources of data used for statistical analysis or regulation. Treatment of depreciation as it relates to income, profits, and cash balances will be covered. Corporation accounts such as capital stock, surplus, reserves, etc., will be treated. The general principles of finding costs of production will also be taken up especially as they relate to costs of producing farm products. The work will proceed by lectures, discussions, and problems. No formal bookkeeping will be required.

ELEMENTARY ITALIAN (year).--Nicholas G. Barbella.
Saturdays beginning Sept. 29. 1 to 3 p.m. Room 3910 South Building.
The course is intended to enable the student to acquire a good reading and speaking knowledge of the language. Special attention will be given to pronounciation, and terms used by Italians in agriculture and economics will be gradually introduced.

ADVANCED ITALIAN. (year).--Nicholas G. Barbella.
Saturdays, beginning Sept. 29. 3 to 5 p.m. Room 3910 South Building.
For students who have had at least one year in elementary Italian.

During the early part of the school year 1933-34, the courses in Italian were discontinued due to the illness of the instructor. We were not able at that time to continue the work through inability to find a suitable instructor. We have now been able to secure the services of Mr. Barbella who is connected with this Department, and who is thoroughly qualified to give the elementary and advanced work.

Dr. A. F. Woods, Director of Graduate School.

Dear Doctor Woods:

I expect to take the course or courses checked in the following list:

GRADUATE COURSES

(1) Ecology
(2) Advanced General Chemistry
(3) Soils and Fertilizers
(4) Plant Genetics
(5) Advanced Statistics for Biological Workers
(6) Enzyme Chemistry
(7) Selected Topics in Physical Chemistry
(8) Introduction to Animal Parasitology
(9) Introduction to Organic Chemistry
(10) Physiological Chemistry
(11) Advanced Organic Chemistry
(12) Taxonomic Mycology
(13) Comparative Nematology
(14) Advanced Statistical Analysis
(15) Adjustment of Observations
(16) History of American Agriculture
(17) Scientific Instruments and Their Use
(18) Recent Developments in Economic Theory
(19) History of Economic Thought
(20) Inflation in Theory and Practice
(21) Plant Anatomy
(22) Advanced Physical Chemistry

UNDERGRADUATE COURSES

(23) Glass Blowing
(24) Systematic Botany
(25) Elements of Economics
(26) Interpreting Agriculture, and Home Economics
(27) Editing Manuscripts on Agriculture, Home Making, and Related Subjects
(28) Elementary Statistical Methods
(29) Scientific French
(30) Intermediate Scientific German
(31) Elementary Russian
(32) Advanced Russian
(33) Elementary Spanish
(34) Advanced Spanish
(35) Beginner's Spanish
(36) Elementary Dutch
(37) The Library, its Organization and Use
(38) Photography
(39) Interpreting Accounting Records and Reports
(40) Elementary Italian
(41) Advanced Italian

If given I would also take a course in_.....

.....

Name.....

Address.....

8/E
NOV 14 1935

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
Washington

January 14
1935

E D U C A T I O N A L C O U R S E S

S E C O N D S E M E S T E R

The second semester of the Graduate School of the United States Department of Agriculture will open as indicated for each course. Classes will meet in the Department buildings at 4:40 or as soon thereafter as the students can assemble. The tuition for each course is $9 for the second semester in case the student has taken the first semester, otherwise it is $12.50. Tuition is to be paid in advance. Passes for entrance to building must be obtained when tuition is paid.

In connection with the Graduate School it is frequently possible for adequately prepared students to do special work on definite problems under supervision in our research laboratories. Those planning to do such work must arrange with the heads of the laboratories concerned and with the Director of the Graduate School. If graduate credit is desired the Dean of the Graduate School to which the credit is to be offered must approve. A limited number of such opportunities will probably be available this year.

Those desiring courses in special subjects, either graduate or undergraduate, should confer with others interested to see if there are enough to make the class self-supporting. In cases where there is a sufficient number an effort will be made to offer such courses if suitable instructors can be found.

In a published statement regarding "Opportunities for Education in Washington" the United States Civil Service Commission makes the following statement relative to the Graduate School: "In addition to the courses given by the Universities and Schools of special class, both the Bureau of Standards and the Department of Agriculture give a number of valuable courses in technical and professional lines which, as in the case of the school classes, are arranged at hours so that Government employees may attend them." Credits for work done in these departmental courses is accepted by many of the standard universities, for undergraduate or graduate credit. The work is conducted on the Standard unit credit hour basis.

It is not practicable for the School to offer Extension courses.

Catalogues of universities and land-grant colleges are kept in my office, Room 4090 South Building, available for consultation.

The Department of Chemistry of the University of Maryland is conducting an evening graduate course in Organic Chemistry during the school year 1934-35. This course carries five credits per semester. The work consists of three lecture hours and six clock hours of laboratory per week. The fee is $10.00 per credit hour. Arrangements can be made to take the lecture work without the laboratory. For new students there will be a $10.00 matriculation fee in the Graduate School. The course is being given by Dr. N. L. Drake, Professor of Organic Chemistry, Room 107 of the Chemistry Building. Inquiries should be addressed to: L. B. Broughton, Head, Department of Chemistry, University of Maryland, College Park, Md. Registration, second semester, Jan. 15- Feb 4.

A list of the courses to be offered will be found on the last page. Please check the course or courses you expect to take, detach the sheet, and return it promptly to Mrs. Emma M. Wolfe, Secretary and and Registrar, 4090 South Building, U. S. Department of Agriculture. It will be necessary this year to register for continuation or for new courses in advance and obtain an identification card for admission to buildings and classes.

Yours very truly,

A. F. Woods.

A. F. Woods,
Director of Graduate School.
4090 South Building.

Sel. 317

(second semester)

ECOLOGY.--Dr. M. B. Waite, assisted by various specialists. Monday and Wednesday, beginning Jan. 14, or as arranged by the class. Room 4609, South Building.

Ecology of plant diseases.--Dr. M. B. Waite, The attempt will be made to develop the principles of ecology as applied to plant diseases. The effect of the various ecological factors will be discussed in relation, first, to the nonparasitic diseases of plants, and second, to the virus and parasitic diseases of plants; and the ecology of insects concerned in transmitting diseases will be considered. The ecology of special-type diseases and special groups of diseases, particularly diseases of fruits, but also of other horticultural and agronomic crops, will be stressed. The problems of the incidence, distribution, and epidemic of parasitic and virus diseases, as well as the factors concerned in the non-parasitic or ecological diseases, will be discussed. Prerequisites, a general knowledge of botany, phytotechny, and plant pathology, and the first semester.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (second semester).--Dr. W. B. Kemp, Mondays, 2 hours, beginning Jan. 14, Room 509, Administration Building.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variances as applied to biological research. Text R. A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

ENZYME CHEMISTRY (one semester).--Dr. A. K. Balls. Tuesdays, beginning Jan. 15, Room 214, Building 216, 13th St., S. W.

A seminar course, studying in detail the recent important advances in this field. Students must possess a general knowledge of enzyme chemistry and in addition a good reading knowledge of German. Registrants should be free to give at least three hours a week to preparative library work.

AN INTRODUCTION TO ANIMAL PARASITOLOGY (one semester).--Dr. J. E. Alicata. Saturday 1:15 to 3:15, beginning Jan. 19 (laboratory period will be arranged). Room 211 East Wing, Administration Building.

The course will consist of a series of lectures and assigned reading, covering the classification, morphology, life history, and host relations of the Protozoa, Platyhelminthes, Nemathelminthes, and Arthropods affecting man and domestic animals. The laboratory work will consist in the studying and identifying the most common animal parasites. Living material will be utilized as far as practicable. The methods of collection, preservation, and preparation for examination will be emphasized. Prerequisites, two college courses in Zoology or their equivalent.

AN INTRODUCTION TO ORGANIC CHEMISTRY. (second semester).--Dr. E. P. Clark. Monday and Thursday, beginning Jan. 14. Room 509, 216 13th St., S. W.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester was devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

PHYSIOLOGICAL CHEMISTRY (second semester).--Dr. Paul E. Howe, Tuesdays, 2 hours, beginning Jan. 15. Room H-337, Bldg. F.

This course will deal with selected topics relating especially to body fluids, tissues, excretions, and secretions, with the consideration of physiological activity in relation to biochemical processes in chemistry. A consideration of the endocrine glands on metabolic activity.

ADVANCED ORGANIC CHEMISTRY (second semester).--Dr. H. L. Haller. Tuesday and Thursday, classes to be held at 8 a.m. Room 2050 South Building. Beginning Jan. 15.

The course will be devoted to a more advanced study of the compounds of carbon. Topics to be covered are the carbohydrates, proteins, fats, terpens, alkaloids, dyes, drugs, plant pigments, stereochemistry, etc. The subject will be varied to suit the needs of the particular group enrolled. An elementary course in organic chemistry or its equivalent is a prerequisite.

TAXONOMIC MYCOLOGY (second semester).--Dr. William W. Diehl. Monday and Friday beginning Jan. 14. (two laboratory periods 4:45 to 6:45) Room 318, West Wing.

This course is planned for those persons previously equipped with a general knowledge of fungus morphology who desire an intimate acquaintance with methods and the technical literature of taxonomic mycology. Chief consideration will be given to study an identification of specimens gathered by members of the class.

ADVANCED STATISTICAL ANALYSIS (second semester).--Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning Jan. 15. Room 2050, South Building.

Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretations of conclusions drawn from quantitative data.

ADJUSTMENT OF OBSERVATIONS (second semester).--Dr. W. Edwards Deming. Thursdays from 4:45 to 6:45. beginning Jan. 17, Room 2066 Commerce Building.

On the basis of the normal parent population, the sampling distributions of u. s, and z and of various derived functions will be developed. These will lead to several statistical tests for the mean and standard deviation of the parent population. Charts and tables for such tests will be distributed, and the tests will be illustrated and compared with an actual set of 100 samples. Fisher's notion of fiducial values will be discussed. The estimation of the probable error of a mean by the empirical, maximum likelihood, and posterior methods will follow; together with a discussion of the fluctuations in such estimates. The estimation of the probable error from several samples will be studied. The law of the propogation of error will be developed, and will be followed by an independent derivation of the distribution of a linear function of several samples. This will lead to the u and z tests for the significance of two means. The distribution of Chi-square for curve fitting will be found, and the Chi-test and the analysis of variance will be developed for the detection of constant and systematic errors. Least squares will be studied as a process for minimizing Chi-square, after which the systematic computation and solution of normal equations will be explained. A simplified method of computing Chi-square in the same process will be discovered. There will be an introduction to the theory of fitting a power series by means of orthogonal polynomials. Prerequisite: the first semester or its equivalent.

HISTORY OF AMERICAN AGRICULTURE (Second semester).--Mr. Everett E. Edwards. Tuesday and Thursday, beginning Jan. 15. Room 1040, South Building.

A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

SCIENTIFIC INSTRUMENTS AND THEIR USE (one semester). It has been found that it will be impossible to offer this course at this time because of moving of the laboratories and personnel to Beltsville, Md. It may be offered again next year if arrangements can be made.

RECENT DEVELOPMENTS IN ECONOMIC THEORY. (second semester).--Mr. H. J. Wadleigh. Mondays, 2 hours, 7:30 to 9:30 p.m., beginning January 14, Room 2050 South Building.

Recent developments in economic theory, including: (1) The theory of imperfect competition, with applications to price and wage determination, the distribution of resources between industries, unemployment and the distribution of income; (2) Some recent developments in monetary and business cycle theory; (3) Theory of international trade and recent developments in the theory of international payments.

No text book will be used in this course; readings will include, among other things, selections from the following books: Black, Production Economics; Marshall, Principles of Economics; Knight, Risk, Uncertainty and Profit; Taylor, Principles of Economics; Wicksell, Lectures on Political Economy; Robinson, Economics of Imperfect Competition; Keynes, A Treatise on Money; Harrod, International Economics. They will also include articles in periodicals by the following authors, among others; Jacob Viner, F. H. Knight, E. J. Working, R. F. Harrod, Simon Kuznets.

HISTORY OF ECONOMIC THOUGHT (Second semester).--Dr. Max J. Wasserman. Monday and Wednesday, beginning Jan. 14. Room 337 Administration Building.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresme. The Mercantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Riviere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill: The Socialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Kneis, Killegrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics -- Veblen, Piqou, J. M. Clark, J. R. Commons, R. G. Tugwell

INFLATION IN THEORY AND PRACTICE (second semester).--Dr. Max J. Wasserman. Tuesday and Thursday, beginning Jan. 15. Room 4007, South Building.

This course will examine and analyze the theory and practice of inflation with special reference to the European post-war inflations and the present-day monetary devaluation and inflation programs. It was begun with a brief resumé of the most important inflation periods in history, such as the Mercentilist inflation of 1500-1750, the Restriction Period of the Bank of England 1798-1819, American colonial paper money inflation, the greenbacks, and the free silver movement. The course will then take up an intensive study of the post-war inflations in Europe and of the present inflationary programs. The lecture material will present, among other things, the results of a recent field investigation made in Europe of the economic and social effects of inflation, special emphasis being placed on the quantitative aspects.

An attempt will be made to evaluate the current theories of inflation, and to construct new theories in the light of recent developments and investigations.

PLANT ANATOMY (second semester).--Dr. Ernst Artschwager. Saturdays 1:30 - 4:30, beginning Jan 12, Room 401, West Wing.

This course is designated to give a working acquaintance with the internal morphology of vascular plants and emphasis is placed on practice in interpretation and determination of material. There is available for study a large selection of prepared slides, but each student will also be required to workout the anatomy and ontogeny of a given plant which will include: fixing of the material, embedding, sectioning, staining and preparation of photomicrographs. In order to facilitate the work there will be at the beginning of the course practical demonstrations in important laboratory technique.

ADVANCED PHYSICAL CHEMISTRY. (second semester).--Prof. Malcolm Haring of the University of Maryland. Three hours per week, Monday, Wednesday, and Friday, beginning January 14, Room 337 Administration Building.

This course aims to furnish the student with a thorough background in the laws and theories of chemistry. (The gas laws, kinetic theory, liquids solutions, elementary thermodynamics, thermochemistry, equilibrium, chemical kinetics, etc., will be discussed.)

Students registering should have had quantitative analysis, general physics, and calculus, as prerequisites. Those with fewer prerequisites should consult the instructor.

The course will not be given unless there are at least 12 students registered.

PATENT LAW FOR SCIENTIFIC WORKERS (second semester).--Dr. Joseph Rossman of the U. S. Patent Office. Monday and Friday, beginning January 16, Room 5075, South Building.

This course is intended especially for research workers in government laboratories and bureaus who may develop new methods, apparatus, products and certain types of living plants and to give them a practical working knowledge and background of their legal rights, remedies and procedure.

In the first semester the fundamental principles of patent law were covered, including a study of the basic patent laws, the types of physical, chemical, and biological discoveries or inventions which can be patented, the different legal tests for determining patentable invention and novelty, the rights under patents, particularly in regard to government employees, infringement, licenses, royalties, etc. Special attention was also given to the new plant patent law under which certain types of living plants may be patented. The procedure in preparing and prosecuting patent applications was also taken up.

In the second semester further details of patent prosecution will be studied such as amendments, interferences, appeals, disclaimers and reissues. Special patent problems in the fields of drugs and medicines, bacteriology, foods, and metallurgy will be discussed and illustrated with actual cases. Some attention will also be given to the commercialization of inventions. The patent policies of universities institutions and commercial organizations will also be surveyed.

GLASS BLOWING (second semester). -- Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning Jan. 14. Basement of Smithsonian Institution.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" were utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

SYSTEMATIC BOTANY. (second semester).--Dr. S. F. Blake. Monday and Wednesday, beginning February 18. Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester was devoted to lectures on the general principles of classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower were studied. The principles of botanical nomenclature were discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

ELEMENTS OF ECONOMICS. (second semester).--Dr. L. Volin, Tuesday and Thursday, beginning January 15, at 5 P.M. Room 1039 South Building.

This is an introductory course in economic principles and institutions. It will aim to give a picture of the modern economic society, its organization and functioning and to serve as a foundation for more advanced and specialized study of economics. Among the subjects treated will be: Value and price determination; money and credit; business cycle and the price level; distribution of income; taxation, types of business organization in industry and agriculture; international trade and commercial policies; the labor problem; public control of economic activity and proposals of economic reform.

INTERPRETING AGRICULTURE AND HOME ECONOMICS. (second semester).--M. S. Eisenhower and staff. Tuesday and Thursday, beginning January 15, Room 302, Administration Building.

Students will be required to prepare interpretive articles for magazines and newspapers, as well as interpretive addresses for radio broadcasting. The course will be built, around actual practice in writing interpretive material. Each student will have the privilege of preparing articles or addresses on subjects of his own selection. These

will be used as a basis for class discussions. The main purpose will be to aid each student, select significant subjects for articles or addresses, organize the material properly, present it in a way that it will appeal to the readers of specific journals or to radio listeners, and finally, edit the material for effectiveness in style. Criticisms will be made by both instructors and students. Addesses will be broadcast on the Department's practice equipment and criticisms will be offered on the basis of auditions rather than on critical readings. The enrollment for this course is limited to 15 students, to permit the instructors to give individual, attention to the writings of each student. However, a minimum of 8 is required.

ELEMENTARY STATISTICAL METHODS (first semester).--B. R. Stauber and F. J. Hosking. Tuesday and Thursday, beginning January 15, Room 4011 South Building.

This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of statistical data in the form of tables and graphs, and the elementary analysis of statistical data. This analysis takes up the different types of averages, the measures and use of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

ELEMENTARY STATISTICAL METHODS (second semester).--B. R. Stauber and F. J. Hosking, Monday and Wednesday, beginning January 14, Room 2050, South Building.

This will be a continuation of the first semester, begun in September and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and multiple linear correlation.

SCIENTIFIC FRENCH (second semester).--Dr. H. B. Humphrey. Monday and Wednesday, beginning January 14. Room 5610 South Building.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics. etc. Such instruction in the reading and translation of French as will enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Joursier's Economic Rurale, Moffatt's Science French Course.

INTERMEDIATE SCIENTIFIC GERMAN (second semester).--Dr. Ernst Artschwager. Tuesday and Thursday, beginning January 15. Room 401 West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the need of those whose knowledge has

lapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY RUSSIAN (second semester).--Dr. C. H. Lienweber. Wednesday, beginning January 14. Room 4011 South Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbooks: Bondar's Simplified Russian Method.

BEGINNERS' RUSSIAN (one semester).--To be arranged by Dr. C. H. Leinweber in case there are enough applicants. See him in Room 4011 South Building, Tuesday January 15, from 4:30 to 6:30.

ELEMENTARY SPANISH (second semester).--Henry R. Bartmann. Tuesdays 4:45 to 6:45, beginning January 15, at 5 p.m. Room 1866, South Building.

The course consists of 2 lessons per week in higher Grammar. Prerequisite two semesters of Spanish Grammar.

ADVANCED SPANISH (second semester).--Henry R. Bartmann. Wednesday and Friday, beginning January 16 at 5 p.m. Room 1866, South Building.

This course consists of one lesson per week in higher Grammar and one lesson in reading Spanish text. Prerequisites, two semesters of elementary Spanish.

BEGINNER'S SPANISH (second semester).--Henry R. Bartmann. Monday and Thursday, beginning January 14, at 5 p.m. Room 1866, South Building.

BEGINNERS' SPANISH (one semester).--To be arranged by Mr. Henry R. Bartmann in case there are enough applicants. See him in Room 1866 South Building, every day from 5 to 6, beginning January 3 until January 14.

ELEMENTARY DUTCH (year).--Dr. Emile Simon. Beginning Tuesday, January 15, at which meeting dates for the class will be fixed. Room 4090, South Building.

First Semester.--This is designed to master the elements of Dutch Grammar.

Second Semester.--Continuation, with special emphasis on translation.

ELEMENTARY ITALIAN (year).--Nicholas G. Barbella. Saturdays beginning January 19, 1 to 3 p.m. Room 2050 South Building.

This course is intended to enable the student to acquire a good reading and speaking knowledge of the language. Special attention will be given to pronounciation, and terms used by Italians in agriculture and economics will be gradually introduced.

ADVANCED ITALIAN (year).--Nicholas G. Barbella. Saturdays, beginning January 19, 3 to 5 p.m. Room 2050 South Building.

For students who have had at least one year in elementary Italian.

THE LIBRARY, ITS ORGANIZATION AND USE (one semester).--Miss Claribel Barnett assisted by library specialists.

It has been found that it will be impossible to offer this course at this time because of moving books into new stacks in the Library. It may be offered next year.

PHOTOGRAPHY (one semester).--Mr. C. H. Hanson and other specialists. Two periods a week beginning Monday, February 18, 1935. Room 4415 South Building, Time, 4:50 p.m.

To meet the needs of the Department's professional photographers, who are working along special lines, and of those who took the course on the Principles of Photography offered in 1933, the course for 1935 has been planned so that students may take all or part of the course. As will be noted in the following tentative outline, the course has been divided into three parts.

Date	No. of Lecture	PART I Subject	Lecturer	Service
2-18	1	Photographic lenses and how to use them.	C.H.Hanson	Extension Service.
2-20	2	Cameras.	F.M.Blake	Off. of Information
2-25	3	Photographic apparatus and accessories.	F.M.Blake	Off. of Information
2-27	4-5	Plates, Films, and exposure.	F.W.Swan	Eastman Kodak Co.
3-6	6	Developing negatives.	F.W.Swan	Eastmen Kodak Co.
3-11	7-8	Printing	W.H.Cross	Eastman Kodak Co.
3-18	9	Photographic rendering of color in monochrome.	Mary Elton	Eastman Kodak Co.
3-20	10	The camera in use.	E.L.Crandall	Bureau Plant Ind.
3-25	11	Selection and arrangement of subject.	C.H.Hanson	Extension Service.
3-27	12	How to tell a story.	G.W.Ackerman	Extension Service.
4-1	13	Miniature camera photography.		E.Leitz, Inc.
4-3	14	Enlarging.	By member of Lab.Staff	Technical Nat'l Geographic Society.

PART II

4-8	15	Photography of insects and small objects.	J.J.Pratt,	Bureau Ent. & Pl.Q.
4-10	16	Photography of pathological material.	R. Reeve	Army Med. Museum.
4-15	17	Line work and copying.	F.M.Blake	Off. of Information.

Date	No. of Lecture	Part II (cont'd)	Lecturer	Service
4-17	18-19	Photography with artificial light.	A.B.Cornish	Eastman Kodak Co.
4-24	20	Photomicrography.	E.Artschwager	Bur. Pl. Ind.
4-29	21	"	M.L.Foubert	Off. of Information
5-1	22	Photomicrography - low power.	Kenneth Lohman	Dept. of the Interior
5-6	23	Infra red photography.	A.B.Cornish	Eastman Kodak Co.
		PART III		
5-8	24	Photography of interiors.	G.W.Ackerman	Extension Service.
5-13	25	Photography of buildings, structures and implements.	J.K.Hiller	Bur. Public Roads.
5-15	26	Photography of agronomical subjects.	C.H.Hanson	Extension Service.
5-20	27	Photography of flowers, fruits, and vegetables.	E.L.Crandall	Bur.Plant Ind.
5-22	28	Photography of plants.	R.L.Taylor	Bur.Plant Ind.
5-27	29	Photography of livestock.	W.A.Stenhouse	Bur.Animal Ind.
5-29	30	Color photography.	By member of Technical Laboratory Staff Nat'l Geographic Society.	
6-3	31	Photographs for publication and film strips. Filing photographs and negatives.	C.H.Hanson	Extension Service.

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The tuition is $12.50 for the entire course and a proportional tuition for parts II and III.

We urgently request that workers having special problems or other aspects of the subject that may be desired, call them to the attention of the Director so that the course may be made as helpful as possible. As far as time permits each student will have opportunity to confer with specialists on his or her photographic problems. One of the outstanding needs of scientific and educational work is good illustrations. This is an opportunity to improve the technique of their preparation.

ADMINISTRATIVE LAW (one semester).--Dr. Victor E. Cappa, A.B. and J.D. Monday and Wednesday, beginning January 14, Room 4092, South Building.

This course will deal with administrative agencies, particularly the new deal instrumentalities, their constitutional and statutory bases, their functions, and the judicial control of administrative actions and decisions. In broad outline the subject matter to be covered by these lectures will be as follows:

(1) The development and significance of administrative legislation and adjudication.

(2) Advantages and disadvantages of the administrative technique.

(3) Types and forms of administrative authorities.

(4) Technical methods of judicial control of administrative tribunals and regulatory authorities.

(5) The principles of statutory construction.

(6) Constitutional questions involved in the new deal legislation.

(7) The delegation of legislative power to administrative agencies and the validity of departmental regulations issued pursuant thereto.

(8) The Organic Act and regulatory statutes administered by the Department of Agriculture.

FOOD SELECTION FOR GOOD NUTRITION. (one semester).--Dr. H. E. Munsell and Dr. H. K. Stiebeling. Tuesday and Thursday, beginning January 29, 1935. Room 6423 South Building.

This course will consist of selected readings, discussions, class exercises, and demonstrations to give the non-specialist a working knowledge of the fundamental principles of nutrition. It will include a study of the nutritional needs of the body under different circumstances, the nutritive values of different types of foods, and the selection of food combinations to yield adequate and satisfying meals. Especial stress will be laid on the selection of adequate diets at different levels of cost, and on the effect of food preparation on the digestibility and nutritive value of food. The following prerequisites are desirable, but not necessary except for those who wish graduate credit; a general course in physiology, inorganic and organic chemistry, and physics.

INTERPRETING ACCOUNTING RECORDS AND REPORTS. (second semester).--W. H. Rowe. Tuesday and Thursday, beginning January 15. Room 3515, South Building.

This course will cover the general accounting principles necessary for an understanding of accounting records and reports and the processes by which they are prepared. Emphasis will be placed upon a study of the general ledger accounts, the balance sheet, the statement of profit and loss, the other sources of data used for statistical analysis or regulation. Treatment of depreciation as it relates to income, profits, and cash balances will be covered. Corporation accounts such as capital stock, surplus, reserves, etc., will be treated. The general principles of finding costs of production will also be taken up especially as they relate to costs of producing farm products. The work will proceed by lectures, discussions, and problems. No formal bookkeeping will be required.

All courses subject to withdrawal if less than fourteen students are registered, except by special arrangement.

Fees paid for courses withdrawn will be returned.

<u>You must register in advance to get admission card to building and classes.</u>

Dr. A. F. Woods, Director of Graduate School.

Dear Doctor Woods:

I expect to take or continue the course or courses checked in the following list:

		Page
(1)	Ecology.	3
(2)	Advanced Statistics for Biological Workers	3
(3)	Enzyme Chemistry	3
(4)	Introduction to Animal Parasitology.	3
(5)	Introduction to Organic Chemistry.	4
(6)	Physiological Chemistry.	4
(7)	Advanced Organic Chemistry	4
(8)	Taxonomic Mycology	4
(9)	Advanced Statistical Analysis	4
(10)	Adjustment of Observations.	5
(11)	History of American Agriculture	5
(12)	Recent Developments in Economic Theory	6
(13)	History of Economic Thought	6
(14)	Inflation in Theory and Practice	6
(15)	Plant Anatomy.	7
(16)	Advanced Physical Chemistry	7
(17)	Patent Law for Scientific Workers	7
(18)	Glass Blowing	8
(19)	Systematic Botany	8
(20)	Elements of Economics	8
(21)	Interpreting Agriculture and Home Economics . . .	8
(22)	Elementary Statistical Methods (first semester). .	9
(23)	Elementary Statistical Methods (second Semester) .	9

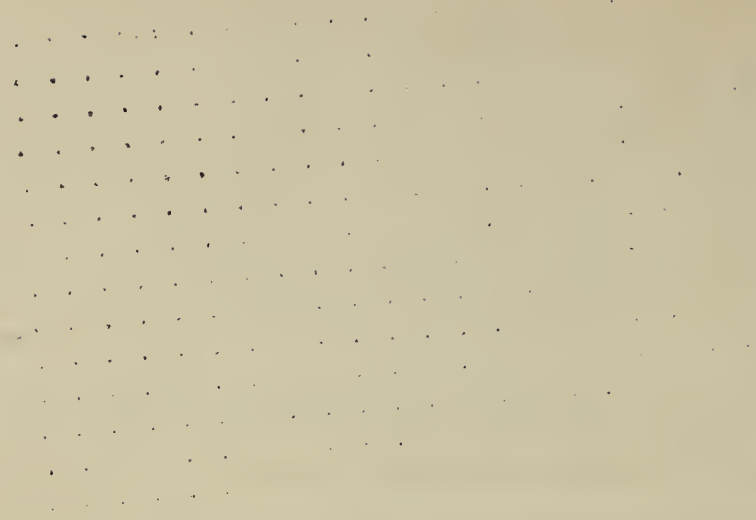
		Page
(24)	Scientific French	9
(25)	Intermediate Scientific German	9
(26)	Elementary Russian	10
(27)	Beginner's Russian	10
(28)	Elementary Spanish	10
(29)	Advanced Spanish	10
(30)	Beginner's Spanish	10
(31)	Elementary Dutch	10
(32)	Elementary Italian	10
(33)	Advanced Italian	10
(34)	Photography	11
(35)	Administrative Law	13
(36)	Food Selection for Good Nutrition	13
(37)	Interpreting Accounting Records and Reports	13

If given I would also take a course in _____

_____

Name_____

Address_____



MISS LACY.

PHOTOGRAPHY (one semester) Mr. C. H. Hanson and other specialists. Two periods a week beginning Monday, February 18, 1935. Room 4415 South Building. Time, 4:50 p.m.

In 1933 a course on the Principles of Photography was offered by Dr. Carroll of the Bureau of Standards. The course emphasized the physical and chemical aspects of the subject matter.

We plan to offer during the second semester of 1934-35, a course on the more practical aspects of the subject, presented by the best obtainable practical experts in each field.

To meet the needs of the Department's professional photographers, who are working along special lines, and of those who took the course on the Principles of Photography offered in 1933, the course for 1935 has been planned so that students may take all or part of the course. As will be noted in the following tentative outline, the course has been divided into three parts.

LIBRARY

Date	No. of Lecture	Subject	Lecturer	Service
		PART I		
2-18	1	Photographic lenses and how to use them.	C.H.Hanson	Extension Service.
2-20	2	Cameras.	F.M.Blake	Off. of Information.
2-25	3	Photographic apparatus and accessories.	F.M.Blake	" " "
2-27	4-5	Plates, films, and exposure.	F.W.Swan	Eastman Kodak Co.
3-6	6	Developing negatives.	F.W.Swan	Eastman Kodak Co.
3-11	7-8	Printing.	W.H.Cross	Eastman Kodak Co.
3-18	9	Photographic rendering of color in monochrome.	Harry Elton	Eastman Kodak Co.
3-20	10	The camera in use.	E.L.Crandall	Bureau Plant Ind.
3-25	11	Selection and arrangement of subject.	C.H.Hanson	Extension Service.
3-27	12	How to tell a story.	G.W.Ackerman	Extension Service.
4-1	13	Miniature camera photography.		E. Leitz, Inc.
4-3	14	Enlarging.	By member of Technical Lab.Staff,	Nat'l Geographic Society.
		PART II		
4-8	15	Photography of insects and small objects.	J.J.Pratt,	Bureau Ent. & Pl.Q.
4-10	16	Photography of pathological material.	R. Reeve	Army Med. Museum.
4-15	17	Line work and copying.	F.M.Blake	Off. of Information.
4-17	18-19	Photography with artificial light.	A.B.Cornish	Eastman Kodak Co.
4-24	20	Photomicrography.	E.Artschwager	Bur. Pl. Ind.
4-29	21	"	M.L.Foubert	Off. of Information.
5-1	22	Photomicrography - low power.	Kenneth Lohman	Dept. of the Interior
5-6	23	Infra red photography.	A.B.Cornish	Eastman Kodak Co.

PART III

Date	No. of Lecture	Subject	Lecturer	Service
5-8	24	Photography of interiors.	G.W.Ackerman	Extension Service.
5-13	25	Photography of buildings, structures and implements.	J.K.Hiller	Bur. Pub. Roads.
5-15	26	Photography of agronomical subjects.	C.H.Hanson	Extension Service.
5-20	27	Photography of flowers, fruits, and vegetables.	E.L.Crandall	Bur. Plant Ind.
5-22	28	Photography of plants.	R.L.Taylor	Bur. Plant Ind.
5-27	29	Photography of livestock.	W.A.Stenhouse	Bur. Animal Ind.
5-29	30	Color photography.	By member of Technical Laboratory Staff, Nat'l Geographic Society.	
6-3	31	Photographs for publication and film strips. Filing photographs and negatives.	C.H.Hanson	Extension Service.

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The tuition is $12.50 for the entire course and a proportional tuition for Parts II and III.

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A. F. Woods,
Director of the Graduate School,
U. S. Department of Agriculture.

JUN 1 1935

G R A D U A T E S C H O O L

DEPARTMENT OF AGRICULTURE

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A special 10-week course in "Elements of Personnel Administration" will be given in the Graduate School of the Department of Agriculture on Friday afternoons* from 4:45 to 6:15 P.M., starting April 5. The course will be held in the air-conditioned Department of Agriculture auditorium. This course is open to all government employees in Washington, D. C., especially those who are interested in preparing themselves for supervisory positions, or who are holding supervisory positions. There are no special prerequisites. The fee for the course is $5.00. The course may be taken for credit, which will be one semester hour, or merely audited. Those persons not taking the course for credit will not be required to take any examinations. About 250 pages of outside reading will be required for those desiring credit.

Registration for the course may be made at the Department of Agriculture Graduate School (Room 4090 South Bldg.) at any time between 9:00 A. M. and 5:30 P. M., or by mail. A special registration period will be held from 4:30 to 6:00 P. M., April 4 at the auditorium. All those desiring to take the course are urged to register promptly. No one will be permitted to attend the lectures without showing a registration card. It is hoped that government employees in offices some distance from the Department of Agriculture will be able to arrange to be released from work sufficiently early to be able to take this valuable course.

Mr. Peter Keplinger, Forest Service, will act as chairman and A. C. Edwards, Bureau of Agricultural Economics as coordinator of the course.

This course is designed to fill a much-needed demand in the Federal Service for a basic course of training in personnel administration which would reach, and be open to, all government employees. A group of outstanding lecturers each with a national reputation in some phase of the subject has been secured. This group includes such men as Dr. Leonard D. White, Civil Service Commissioner; Dr. Herman Feldman, Professor of

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* Except Friday, April 19; this lecture will be held Thursday, April 18.

(over)

Industrial Relations, Dartmouth College; Dr. H. S. Person, Consultant in Business Economics and Management, New York City; Dr. Ordway Tead, noted author and lecturer in personnel administration at Columbia University; Dr. W. W. Stockberger, Director of Personnel, Department of Agriculture; Dr. W. J. Donald, Managing Director, National Electrical Manufacturers Association, New York City.

Elements of Personnel Administration are essentially a study of the management of personnel on the job. The lectures will cover not only the theory and principles of the subject but actual techniques and methods developed through research and tested by experience in progressive organizations. It will be demonstrated that the supervision and direction of personnel need not be by "rule of thumb" but can be placed on a scientific basis. Subjects such as incentive and impulsion; training on the job; technique of supervision; job analysis; inspecting evaluating, planning, coordinating, and measuring output; discipline; complaints and how to handle them will be covered. The presentation will be popular rather than technical and will be of interest and value both to the supervisor and to the one being supervised.

Mimeographs or reprints taken from the outstanding books on subjects of personnel administration will be used in the course to integrate and supplement the lectures.

U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
1935-36

The general circular of information relative to courses of instruction available in the Graduate School of the U.S. Department of Agriculture will be available after July 15, 1935. A limited number of copies will be forwarded to the Chief Clerks of the various government units for distribution to those requesting them, or they may be obtained by sending name and address to Dr. A. F. Woods, Director, Graduate School, 4090 South Building, U.S. Department of Agriculture. The courses for 1935-36 include the following:

1. The Library, Its Organization and Use (2)
2. Elements of Personnel Administration (1-1/2)
3. Administrative Law (2)
4. Federal Jurisdiction and Procedure. Second Semester (2)
5. History of American Agriculture (2)
6. Recent Developments in Economic Theory (2)
7. History of Economic Thought (2)
8. Mathematics for Students of Economic Theory and Statistics (2)
9. Principles of Accounting (2)
10. Advanced Statistical Analysis (2)
11. International Trade (2)
12. Elementary Statistical Methods (2)
13. Colloid Chemistry, or Electrochemistry, or Phase Rule and Catalysis (2)
14. Soils - (Composition of Soils) (2)
15. Soils - "Their Morphology, Genesis and Classification" (3)
16. Glass Blowing (1-1/2)
17. An Introduction to Organic Chemistry (2)
18. Basic Photography (2)
19. Plant Ecology (2)
20. Plant Diseases with Special Reference to Cause and Control (2)
21. Plant Anatomy (3)
22. Systematic Botany (2)
23. Plant Genetics (2)
24. An Introduction to Animal Parasitology (3)
25. Extension Seminars (2)
26. Editing Manuscripts on Agriculture, Home Making and Related Subjects (3)

27. Elementary German	(2)	34. Elementary Italian	(2)
28. Intermediate Scientific German	(2)	35. Advanced Italian	(2)
29. Elementary Russian	(2)	36. Phonetics	(2)
30. Advanced Russian	(2)	37. Elementary Dutch	(2)
31. Elementary Spanish	(2)	38. Advanced Dutch	(2)
32. Advanced Spanish	(2)	39. Elementary Portugese	(2)
33. Scientific French	(2)	40. Advanced Portugese	(2)

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes. The cost per semester for two hour courses $12.00; three hour courses $15.00; glass blowing $18.00. Personnel Administration course $5.00. Figure in parenthesis indicates number of hours each week per semester.

1935-36

G R A D U A T E S C H O O L

DEPARTMENT OF AGRICULTURE

* * * * * * * * * * *

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Mimeographs or reprints taken from the outstanding books on subjects of personnel administration will be used in the course to integrate and supplement the lectures.

LECTURES ON
CURRENT ECONOMIC PROBLEMS

United States Department of Agriculture Graduate School
Cooperating with School of Public Affairs of American University

Charles F. Sarle
Principal Economist, Bureau of Agricultural Economics
Chairman of the Course

Date	Speaker	Subject
	FIRST HALF	
October 19, 1935	Secretary Henry A. Wallace	"What Revision is Needed in Fundamental Economic Concepts and Objectives?"
October 26, 1935	Walton H. Hamilton	"Is the Constitution Adequate to the Necessities of Public Control?"
November 2, 1935	Alvin H. Hansen	"Is the Self-regulating Economy Workable in Current International Relations?"
November 9, 1935	Isador Lubin	"Trade Union Organization and Labor's Bargaining Power."
November 16, 1935	Calvin B. Hoover	"What Are the Advantages and Disadvantages of Alternatives of Capitalism?"
November 23, 1935	Jacob Viner	"Business Cycle Theory--Can Depressions be Tempered or Avoided?"
	SECOND HALF	
December 7, 1935	Harold G. Moulton	"What Are the Economic Effects of Spending as Compared with Saving?"
December 14, 1935	Max J. Wasserman	"Some Consequences of Our Present Monetary Policy."
January 11, 1936	Eveline M. Burns	"What Can America Learn from German Experience in Handling Chronic Unemployment?"
January 18, 1936	Josef Schumpeter	"Can Capitalism Survive?"
January 25, 1936	Leon C. Marshall	"What Phases of N.R.A. Activity Appear to be Economically Sound and Practical?"
February 1, 1936	H. Julian Wadleigh	"Recent Trends in Economic Theory."

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Department of Agriculture Auditorium, 14th and Independence Ave., S.W., 2 P.M.

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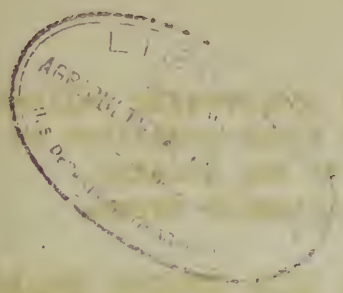
Register with Dr. A. F. Woods, Director of Graduate School, Room 4090, South Bldg.
Fee for Remainder First and Second Halves $4.50; Second Half only $2.50.

JUN 8 1935

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON



EDUCATIONAL COURSES - 1935-36

Beginning September 16, 1935

The Graduate School of the United States Department of Agriculture will open the 1935-36 school year the week beginning September 16. Classes will meet in the Department buildings at 4:40 P.M. or as soon thereafter as the students assemble. The tuition will be $12.00 a semester for two hour a week studies and $15.00 a semester for three hour a week studies, except as otherwise indicated. Registration fee for classes discontinued on account of small registration will be returned. Students withdrawing from classes having 15 or less will not be entitled to refund. A $2.00 registration fee is retained in case of withdrawal from continued classes. Register in advance. No one will be admitted to class without a registration card.

The Congress of the United States had made special provision for making the facilities for study and research in the Government Departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe. (27 statutes 395 and 31 statutes 1010.) Under this authority and the provisions of the Organic Act establishing the Department a School of Graduate Studies was organized in 1920 for the benefit of Department employees and such others as are qualified to undertake the work offered.

The work is organized on a standard college basis and certificates of credit for the work accomplished are issued on a standard unit basis. This work has been accepted by graduate schools of accredited colleges and universities wherever it fits in to the approved program of the student.

The plan provides first for work by graduate or advanced students by special arrangement through the graduate schools of accredited colleges with the Graduate School of the Department of Agriculture for the utilization of the available facilities of Government laboratories and collections, in the study of an approved problem under the general supervision of a qualified government specialist.

The second type of work is formal class and laboratory work conducted after 4:30 P.M. or 1 P.M. Saturdays in such subjects as may be helpful to government workers. Everything necessary is done to insure the highest standard of work so that it may be satisfactory to the Government and co-operating colleges.

The Graduate School certifies credits earned. Acceptance, of course, depends on the rules of the college to which the credits are presented. The instructors are selected from the best qualified members of the scientific

and professional staffs of the various Bureaus and nearby cooperating colleges. They are, of course, mostly in the Civil Service and hold their positions by reason of merit. They compare favorably with the staffs of the leading colleges and universities from which most of them were originally drawn.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

SEMINARS

The Library, Its Organization and Use. Tuesdays and Thursdays beginning September 24 - Room 0039 South Building. Miss Claribel Barnett assisted by library specialists. This is a non-credit course designed to aid in the understanding and use of the library and library procedures. It will be repeated each semester as long as there is a demand for it. No charge is made for the course. Those admitted will be registered by the Librarian. A certificate of the work accomplished will be issued by the Graduate School. Information regarding similar seminar courses in other subjects may be obtained from the Director of the Graduate School.

The latest catalogues of universities and colleges are available for consultation in the Office of the Director, room 4090, South Building. Inquiries regarding the school should be addressed to A. F. Woods, Director of the Graduate School, Bureau of Plant Industry, 4090 South Building, U.S.D.A.

Apr. 3-1934

Elements of Personnel Administration (Ten Weeks) Fridays 5 to 6:30 P.M., Department of Agriculture Auditorium. This course is designed to fill demand in the Federal Service for a basic course of training in personnel administration which would reach, and be open to, all government employees. A group of outstanding lecturers each with a national reputation in some phase of the subject will be secured. This group last year included such men as Dr. Leonard D. White, Civil Service Commissioner; Dr. Herman Feldman, Professor of Industrial Relations, Dartmouth College; Dr. H. S. Person, Consultant in Business Economics and Management, New York City; Dr. Ordway Tead, noted author and lecturer in personnel administration at Columbia University; Dr. W. W. Stockberger, Director of Personnel, Department of Agriculture; Dr. W. J. Donald, Managing Director, National Electrical Manufacturers Association, New York City, and others. These or equally competent men will take part in the work this year.

Elements of Personnel Administration is essentially a study of the management of personnel on the job. The lectures will cover not only the theory and principles of the subject but actual techniques and methods developed through research and tested by experience in progressive organizations. It will be demonstrated that the supervision and direction of personnel need not be by "rule of thumb" but can be placed on a scientific basis. Subjects such as incentive and impulsion; training on the job; technique of supervision; job analysis; inspection, evaluating, planning, coordinating, and measuring output; discipline; complaints and how to handle them will be covered. The presentation will be popular rather than technical and will be of interest and value both to the supervisor and to the one being supervised. Books on the subject are available in the Agriculture Library, first floor, South Building.

Mimeographs or reprints on subjects of personnel administration will be used in the course to integrate and supplement the lectures.

There are no special prerequisites. The course is open to all Government employees in Washington. The fee for the course is $5.00. Registration by mail should be accompanied by check or Post Office money order for $5.00. The course may be taken for credit or simply audited. Advanced courses in special phases of the subject are planned.

ADMINISTRATIVE LAW (one semester) - Elmer D. Hays, A.B. and L.L.B. Monday and Wednesday, beginning January 13, Room 4702, South Building.

This course will deal with the separation of powers of the government into (a) legislative power, (b) executive power, (c) judicial power and (d) admixture of powers, with special emphasis upon the development of administrative agencies, their constitutional and statutory authority, their function, and the control of administrative action by judicial decisions. In broad outline the subject matter to be covered by these lectures will be as follows:

(1) The development and significance of administrative legislation and adjudication.

(2) Advantages and disadvantages of the administrative technique.

(3) Types and forms of administrative authorities.

(4) Technical methods of judicial control of administrative tribunals and regulatory authorities.

(5) The principles of statutory construction.

(6) Constitutional questions involved in the new deal legislation.

(7) The delegation of legislative power to administrative agencies and the validity of departmental regulations issued pursuant thereto.

(8) The Organic Act and regulatory statutes administered by the Department of Agriculture.

FEDERAL JURISDICTION AND PROCEDURE (one semester) Elmer D. Hays, A.B. and L.L.B. Monday and Wednesday, beginning September 16, Room 4072, South Building.

This course will deal with the origin and limitations of the jurisdiction of the federal courts; their constitutional and statutory authority and their function in interpreting and developing the constitution, treatise and laws of the United States. In broad outline, the subject matter to be covered by these lectures will be as follows:

(1) The origin and limits of the jurisdiction of the federal courts.
(2) The Supreme Court and its jurisdiction.
(3) History and origin of inferior federal courts.
(4) Civil controversies over which the federal courts have exclusive jurisdiction.

(5) Cases arising under the constitution.
(6) Removal of cases from state to federal courts.
(7) Habeas corpus.
(8) Appelate jurisdiction of the federal courts.

HISTORY OF AMERICAN AGRICULTURE (year). -- Mr. Everett E. Edwards. Tuesday and Thursday, beginning September 24. Room 1040, South Building.

First semester.-- A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic Coast; indigenous and foreign contributions to American agriculture; Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets of the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.-- A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1850 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

Second semester begins Tuesday, January 21.

RECENT DEVELOPMENTS IN ECONOMIC THEORY (year).--Mr. H.J. Wadleigh. First meeting of the class on Monday, September 23, in Room 3065, South Building, when two weekly dates will be arranged. The instructor may be consulted in Room 5092, South Building.

This course was given last year under the title "Theory of Prices and Price Making" and so described in the preliminary announcement. It is a general survey of economic theory which is concerned with the way in which the price-system is determined by and in turn influences general economic and social conditions. Particular emphasis is given to the results of the work of economic theorists during the past five or ten years, to which the second semester will be mainly devoted. The work of the first semester will deal with the fundamentals of the science which are necessary to an understanding of more recent results. Applications to present-day problems of social control will also be considered. Students should have at least an elementary knowledge of economic theory. Knowledge of elementary calculus will be helpful but not necessary. An outline of the course with a list of headings (subject to later revision) will be available at the first meeting.

First semester.-- A general survey of equilibrium theory in economics with a critical discussion of the assumptions and methods on which it is based and the problems to which it is applicable. Particular attention will be given to: (1) the meaning and uses of such concepts as demand curves, supply curves, cost curves, marginal productivity, elasticity of demand, elasticity of substitution, etc.; (2) The equilibrium of prices, production and consumption under short run conditions; (3) The theory of interest and profits in relation to technical changes and economic growth.

Second semester.-- Recent developments in economic theory, including: (1) The theory of imperfect competition, with applications to price and wage determination, the distribution of resources between industries, unemployment and the distribution of income; (2) Some recent developments in monetary and business cycle theory; (3) Theory of international trade and recent developments in the theory of international payments.

No textbook will be used in this course; readings will include, among other things, selections from the following books: Black, Production Economics; Marshall, Principles of Economics; Knight, Rish, Uncertainty and Profit; Taylor, Principles of Economics; Wicksell, Lectures on Political Economy, Robinson, Economics of Imperfect Competition; Keynes, A Treatise on Money: Harrod, International Economics. They will also include articles in periodicals by the following authors, among others: Jacob Viner, F. H. Knight, E. J. Working, R. F. Harrod, Simon Kuznets.

Second semester begins Monday, January 20.

HISTORY OF ECONOMIC THOUGHT (year).-- Dr. Max J. Wasserman. Monday and Wednesday, beginning September 23. Room 4092 South.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresme. The Mercantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Riviere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill: The Solialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Knois, Hillebrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics -- Veblen, Pigou, J. M. Clark, J. R. Commons, R. G. Tugwell.

MATHEMATICS FOR STUDENTS OF ECONOMIC THEORY AND STATISTICS.-- Dr. W. Edwards Deming. Fridays from 4:45 to 6:45 in Room 2050 South Building, September 27.

First Semester. Review of the fundamental principles of algebra. The binomial. Logarithms. Some analytic geometry and trigonometry. Theory of equations; the linear equation, the quadratic and higher degrees; methods for approximate solutions. Theory and operation of determinants. Short cuts and checks in numerical calculations. Functions; and an introduction to the notion of finite and infinitesimal differences. Interpolation.

Second Semester. An introduction to calculus. Differentiation, maxima and minima; undetermined multipliers; curvature; contact; physical applications of the derivative. Taylor's series, expansion of functions.

Centers of gravity; moments of curves. The Jacobian, and more on derivatives. Interpolation. Integration and quadrature. The Euler-Maclaurin summation formula. Functions defined by definite and indefinite integrals. Series. If time permits, the Gamma and Beta functions will be studied; also asymptotic approximations.

Prerequisite for the second semester: The first semester or its equivalent.

Throughout the course the aim will be to fit the mathematical preparation of the students in the class, so far as is possible. The nature of the material covered will depend more on the attainments and aims of the students than on any predesignated formulary. Special assignments will be given students wishing to work more thoroughly in particular topics.

PRINCIPLES OF ACCOUNTING (year).--William H. Rowe. Tuesdays and Thursdays, (5 P.M.) beginning September 24, Room 3515, South Building.

First Semester. During the first semester the elementary principles and procedures of accounting will be taken up. The work will be carried on by discussion and problems. It is expected that at the end of the semester the student will be prepared to devise the accounting records necessary for a small business organization, make the necessary entries in the records, draw off statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester. Tuesday and Thursday beginning January 14. The work during the second semester will deal with more advanced principles of accounting. Subject matter to be taken up will include the determination of income under special circumstances, the valuation of assets and depreciation policies, manufacturing accounts, farm accounts, partnership accounts, and corporation accounting particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

ADVANCED STATISTICAL ANALYSIS (year).--Mr. C. M. Purves, assisted by Mr. A. Sturges. Tuesday and Thursday, beginning September 24. Room 2050, South Building.

First Semester.--The development, application, and interpretation of advanced sampling methods, including the graduation of frequency series and time series. While there will be a brief review of simply and multiple correlation, emphasizing the underlying mathematical assumptions and the sampling aspects of the problem, yet the student is expected to be thoroughly familiar with the material given in the course in Elementary Statistics. Yule's Introduction to the Theory of Statistics, Ezekiel's Methods of Correlation Analysis, and R. A. Fisher's Statistical Methods for Research Workers' will be used as reference texts. A detailed outline of the course will be available to students at the first lecture.

Second Semester.--Emphasis will be placed on the fundamental mathematical assumptions underlying correlation methods and on sampling. Some time will be spent on the more advanced methods of time series analysis. Attention will be directed to the proper interpretation of conclusions drawn from quantitative data.

Second semester begins Tuesday, January 14.

INTERNATIONAL TRADE. (year).--Dr. L. Volin, Tuesday and Thursday, Room 1039 South Building, Beginning September 17.

The course will be devoted to the discussion of principles of international trade, the mechanism of international payments and commercial policies of the United States and selected foreign countries.

ELEMENTARY STATISTICAL METHODS (year).--B. R. Stauber and F. J. Hosking, Monday and Wednesday, beginning September 23, Room 2050, South Building.

First semester.--This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers and the analysis of time series data. A second semester will be available for those who have completed the first semester.

Second semester.--Monday and Wednesday beginning January 13, Room 2050 South Building. This will be a continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, and multiple linear correlation.

A first semester class will be available for those desiring to begin the second semester.

COLLOID CHEMISTRY (year).-- Dr. Malcolm M. Haring, Monday and Wednesday, beginning September 16. (second semester begins January 20), Room 1039 South Building.

The first semester will be devoted to theoretical considerations and the second semester to practical applications. If there is not sufficient demand for colloid chemistry, Dr. Haring is prepared to offer ELECTROCHEMISTRY or PHASE RULE and CATALYSIS; first semester, theoretical considerations; second semester, practical applications. PLEASE INDICATE PROMPTLY WHICH COURSE YOU DESIRE.

SOILS. (one semester).--Composition of Soils. Dr. Horace G. Byers and other members of the Division of Soil Chemistry and Physics. Tuesday and Friday, beginning September 17. Room - Chemistry Conference Room, 4003 South Building.

The course will discuss the origin of soils and the causes of their development. The methods of examination, both physical and chemical, will be discussed. The topics stressed will be: Soil constitution, soil texture, moisture relationships, colloids, base exchange, soil organic matter. The laboratory processes demonstrated will include mechanical analysis, base exchange methods, electro-dialysis, cataphoresis, and hydrogen-ion determinations. Prerequisites for the course: Graduation from an agricultural college or equivalent under-graduate work in chemistry and physics.

"SOILS: Their Morphology, Genesis and Classification." Dr. Charles E. Kellogg, Acting Chief, Division Soil Survey. Monday, Wednesday and Friday. First semester begins Monday December 16 - Room - Chemistry Conference Room, 4003 South Building.

The course will outline the principles of soil development with examples from the United States. Students should have had the equivalent of college freshman chemistry; previous training in plant physiology, geology, geography, and logic would be helpful, but not essential. The particular material drawn from these fields would be developed in the lecture and/or in assigned readings.

In the development of the course the subject matter will be treated in the following order:

(1) Brief history of the development of soil science, especially in its relationship to agriculture.

(2) The nature of soils. A summarized discussion of the principal properties of the soil mass such as color, texture, structure, colloids, and similar fundamental characteristics. This material will be treated briefly and only those important phases will be discussed which bear directly upon the remainder of the course.

(3) The factors of soil genesis.

(a) Parent rocks and weathering.
(b) Influence of living matter.
(c) Influence of climate.
(d) Influence of relief.

(4) Determination of soil morphology and the classification of types (briefly).

(5) The processes of soil development. This section will include about half or more of the course, and the great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed. These are: calcification, podzolization, laterization, salinization, solodization, solonization, gleization.

(6) Systems of soil classification.

(7) A few lectures at the close summarizing the whole and discussing the implications and relationships to agriculture as a whole.

Second semester. This course will be followed with seminars on land classification; depending upon the wishes of the class one or two lectures at the close will be devoted to land classification.

GLASS BLOWING (year).--Leland B. Clark, Smithsonian Institution. Monday and Wednesday, 1 1/2 hours, beginning September 16. Basement of Smithsonian Institution. Tuition including materials $18.00 a semester.

Some form of glass aparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simply manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" were utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work. Registration is limited to ten students.

Second semester begins Monday, January 13.

AN INTRODUCTION TO ORGANIC CHEMISTRY. (Year).--Dr. E. P. Clark, Monday and Thursday, Room 1130 South Building. First semester begins September 16; second semester January 13.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

BASIC PHOTOGRAPHY (one semester).--Mr. C. H. Hanson and other specialists. Two periods a week. Room 4407 South Building, beginning Monday, November 4.

The course will be elementary and basic in character and will be designed to meet the needs of the amateur. Special emphasis will be placed on lenses and their use, cameras and equipment, films, filters, exposure, elementary photographic chemistry, development of negatives, printing, composition, miniature camera photography, copying, enlarging, home portraiture photography with artificial light, etc. An outline of the course is now under preparation.

If there is sufficient demand from qualified professional and advanced scientific workers for seminar courses, the Graduate School will endeavor to arrange for such courses during the second semester.

PLANT ECOLOGY (year).--Dr. M.B. Waite, assisted by various specialists. Monday and Thursday, beginning October 7. Room 4609, South Building.

First semester. Plant ecology, general.--The general principles of plant ecology, including the soil, climatic, and other factors influencing the principal native plant formations of the United States and the principal crop-plant regions. While special attention will be devoted to the ecology of native flowering plants, the ecology of lower forms of plant life will be considered; the ecology of cultivated crop plants will be stressed; and the local plant formations around Washington, D. C., will be given some attention. The attempt will be made to develop the viewpoint of plant ecology, methods of study, and observation, as bearing on problems in botany and phytotechny. Prerequisites, a general knowledge of botany and of agriculture.

Second semester. Ecology of plant diseases.--Dr. M.B. Waite. The attempt will be made to develop the principles of ecology as applied to plant diseases. The effect of the various ecological factors will be discussed in relation, first, to the nonparasitic diseases of plants, and second, to the virus and parasitic diseases of plants; and the ecology of insects concerned in transmitting disease will be considered. The ecology of special-type diseases and special groups of diseases, particularly diseases of fruits, but also of other horticultural and agronomic crops, will be stressed. The problems of the incidence, distribution, and epidemics of parasitic and virus diseases, as well as the factors concerned in the non-parasitic or ecological diseases, will

be discussed. Prerequisites, a general knowledge of botany, phytotechny, and plant pathology, and the above first semester.

PLANT DISEASES WITH SPECIAL REFERENCE TO CAUSE AND CONTROL. Monday, Wednesday and Friday beginning October 7.

This course is expected to alternate with Ecology. If there is a greater demand for this course it may be substituted for Plant Ecology.

PLEASE INDICATE PROMPTLY WHICH COURSE YOU DESIRE.

PLANT ANATOMY. (year).--Dr. Ernest Artschwager. Saturdays 1.30 - 4.30. Room 522 Administration. First semester begins Saturday, September 14; second semester Saturday, January 18.

This course is designated to give a working acquaintance with the internal morphology of vascular plants and emphasis is placed on practice in interpretation and determination of material. There is available for study a large selection of prepared slides, but each student will also be required to work out the anatomy and ontogeny of a given plant which will include: fixing of the material, embedding, sectioning, staining and preparation of photomicrographs. In order to facilitate the work there will be at the beginning of the course practical demonstrations in important laboratory technique.

SYSTEMATIC BOTANY (year).--Dr. S. F. Blake. Monday and Wednesday, beginning October 3, Room 110, West Wing.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles and classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower were studied. The principles of botanical nomenclature were discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

Second semester begins Monday, January 20.

PLANT GENETICS (one semester).--Dr. W. B. Kemp; will not be offered until 1937-38 unless at least ten applications are received.

AN INTRODUCTION TO ANIMAL PARASITOLOGY (one semester).--Dr. J.E. Alicata. Monday, Wednesday and Friday, beginning September 23 (2 lectures and one laboratory period to be arranged). Room 224 East Wing, Administration Building.

The course will consist of a series of lectures and assigned reading, covering the classification, morphology, life history, and host relations of the Protozoa, Platyheiminthes, Nemathelminthes, and Arthropods affecting man and domestic animals. The laboratory work will consist in the studying and identifying the most common animal parasites. Living material will be utilized as far as practicable. The methods of collection, preservation, and preparation for examination will be emphasized. Prerequisites, two college courses in Zoology or their equivalent.

EXTENSION SEMINARS. (year).--M. C. Wilson. Twice per week, hours arranged to meet the convenience of class. Room 5534 South Building. Open to those with extension teaching experience, or with background of educational training satisfactory to instructor. No tuition fee.

First semester.--Extension Methods.-- Ways of measuring extension progress; the influence of such factors as size of farms, land tenure, educational training, age, and contact with extension workers upon effectiveness of extension teaching.

The various means and agencies employed in extension teaching as: result demonstrations, method demonstrations, meetings, news articles, personal service, bulletins, exhibits, circular letters, extension schools, and radio, will be carefully analyzed from the standpoint of their teaching function; adaptability to different subject matter, relative influence, relative cost, and interrelationship.

Second semester.-- Extension Administration and Supervision.--

Principles of efficient extension administration; analyses of supervisory functions and procedures; duties of State and district supervisors of county agricultural agents and home demonstration agents; relations of State specialists and county workers. Practical study of the problems arising in the administration and supervision of extension at the college and in the field.

EXTENSION THESES. -- M.C. Wilson. Room 5534 South Building. Qualified students interested in undertaking a research problem in extension education may receive credit for special problem work provided an acceptable plan is presented and the completed thesis meets approval of a thesis committee. No tuition fee.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester).--Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Monday, Wednesday, and Friday, beginning September 23. Room 522, Administration Building.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarty with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY GERMAN (year).-- Dr. C. H. Leineweber. Two hours, Monday, 4:45, beginning September 16, Room 223-224, East Wing, Administration Building.

This course is especially designed to enable the student to meet the college requirements for German grammar, and to lay the foundation for translations of both scientific and literary articles. Textbook: College German, by Evans & Röseler.

ELEMENTARY RUSSIAN (year).-- Dr. C.H. Leineweber, Wednesday and Friday (suitable dates will be arranged with the class), beginning September 25. Room 223-224, East Wing, Administration Building.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Method.

ADVANCED RUSSIAN (year).-- Dr. C. H. Leineweber, Tuesday and Thursday, beginning September 24. Room 223-224, East Wing, Administrative Building.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

INTERMEDIATE SCIENTIFIC GERMAN (year).--Dr. Ernest Artschwager, Tuesday and Thursday, beginning September 24. Room 401 West Wing.

Reading and translation of German scientific prose (biology, geology, meteorology, botany, chemistry, physics, etc.), supplemented by a review of German grammar throughout the first semester, the review aiming at a working familiarity with fundamentals so necessary in dealing with involved periodic sentence structure, the course, however, being in part designed to serve the needs of those whose knowledge has hapsed considerably through years of disuse. Texts: Kip's Scientific German Reader and Thomas' Practical German Grammar, both preferably to be acquired before date of first meeting.

ELEMENTARY SPANISH (year).--Henry R. Bartman, Room 4601 South Building, beginning Tuesday and Thursday, September 24, at 5 P.M.

The course consists of two lessons per ~~one~~ week in Grammar.

ADVANCED SPANISH (year).--Henry R. Bartman, Wednesday and Friday, beginning September 25 at 5 P.M. Room 4601 South Building.

This course consists of one lesson per week in higher Grammar and one lesson in reading Spanish text. Prerequisites, two semester of elementary Spanish.

SCIENTIFIC FRENCH (year).--Dr. H. B. Humphrey, Monday and Wednesday, beginning September 23. Room 5610 South Building.

Reading, reviewing, and abstracting of French publications of agricultural botany, farm crops, industries, rural economics, etc. Such instruction in the reading and translation of French as well enable the student to read with ease and intelligence scientific literature pertaining to agriculture and its related industries. Texts: Fabre's Le Livre des Champs and L'Industrie, Joursier's Economic Rurale, Moffatt's Science French Course.

ELEMENTARY ITALIAN (year).--Nicholas G. Barbella.

Saturdays beginning September 28, 1 to 3 p.m. Room 3910 South Building. The course is intended to enable the student to acquire a good reading and speaking knowledge of the language. Special attention will be given to pronounciation, and terms used by Italians in agriculture and economics will be gradually introduced.

ADVANCED ITALIAN. (year).--Nicholas G. Barbella.

Saturdays, beginning September 28, 3 to 5 p.m. Room 3910 South Building. For students who have had at least one year in elementary Italian.

PHONETICS (year).--Harold Van V. Fay, U.S. Tariff Commission. Tuesday and Thursday beginning September 17, 4:45 to 5:45 p.m., Room 5038 South Building.

The first semester consists of a general foundation in phonetics based on the international phonetic alphabet.

The second semester consists in the special application of phonetics to the pronunciation and reading of French, German, Spanish, and Italian. Texts - Bretano Bi-lingual series (in Philadelphia) entitled Introduction to French, German, Spanish, and Italian respectively, at a cost of 80 cents each. The preliminary phonetic training and the start given the students in each of the introductions should easily enable them to continue by themselves in any of the four languages covered and acquire considerable reading fluency with a minimum of effort.

Mr. Fay spent eight months in Tilly Institute, Berlin, studying phonetics and German, and subsequently taught phonetics at Columbia. Passed an examination in phonetics given by Prof. Wilhelm Victor of Marburg University, the leading German phonetician. Helped fix the proper phonetic transcription for Southern Mandarin to be used in the language school of Nanking University. Lectured on English phonetics and taught English by the phonetic method at Nanking University. He took courses and private lessons in French phonetics at Geneva University, Switzerland.

Courses in ELEMENTARY DUTCH and ADVANCED DUTCH, and ELEMENTARY PORTUGESE and ADVANCED PORTUGESE will be available under Dr. Emile Simon, if there are ten or more applicants.

UNITED STATES DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

CHANGES IN THE PROGRAM
1935-36

Please note the following new courses that have been added since mimeographing of the circular - "Educational Courses - 1935-36."

ADVANCED ECONOMICS SEMINARS (year). Dr. Max J. Wasserman, Fridays, beginning September 27, Room 4092 South Building, 7 to 9 p.m.

PRINCIPLES OF ECONOMICS (year). Dr. E. W. Braun, Mondays and Wednesdays, beginning September 16, Room 6554 South Building, 4:45 to 5:45.

MONEY AND BANKING (year). Dr. Max J. Wasserman, Tuesdays and Thursdays, beginning September 24, Room 3065 South Building, 4:45 to 5:45.

MICRO-BIOLOGY (year). Dr. Chas. Wm. Rees, Saturdays and Wednesdays, beginning September 14. Saturdays - lectures 2 to 3 p.m., laboratory 3 to 5 p.m., Room 226-E Adm. Building. Special lectures 12 to 1 every Wednesday in Auditorium. If the course is taken for credit tuition will be $12.00; if only the lectures are attended on Wednesdays the registration fee is $1.00.

ELEMENTARY STATISTICS (2nd) Mr. B.R. Stauber and Mr. F.J. Hosking, Tuesdays and Thursdays, beginning September 24, Room 6554, 4:45 to 5:45.

ELEMENTARY STATISTICS (1st) Mr. B.R. Stauber and Mr. F.J. Hosking, Tuesdays and Thursdays, beginning January 21, Room 6554, 4:40 to 5:40.

ADVANCED PHYSICAL CHEMISTRY (year). Dr. Malcolm M. Haring, Mondays, Wednesdays and Fridays, beginning September 16, Room 1039 South Building, 4:40 to 5:40.

*PERSONNEL MANAGEMENT (advanced) (one semester). Mr. Peter Keplinger, Mondays and Wednesdays, beginning September 23, Room 5110-A South Building, 4:45 to 5:45.

*EXECUTIVE MANAGEMENT AND SUPERVISION (one semester) Mr. Peter Keplinger, beginning January 21,1936, Tuesdays and Thursdays, Room 5110-A South Building 4:45 to 5:45.

DEPARTMENT OBJECTIVES. Lectures, beginning Friday, January 10, 1936, from 4:10 to 5:10, Auditorium, South Building, and will continue each Friday for eleven consecutive weeks. Registration required but no fee.

* Coordinated with similar courses in American University.

(over)

The following changes have been made in circular:

RECENT DEVELOPMENTS IN ECONOMIC THEORY by Mr. H. J. Wadleigh deferred for one year.

MATHEMATICS FOR STUDENTS OF ECONOMIC THEORY AND STATISTICS by Dr. W. Edwards Deming will begin September 20 instead of the 27th.

INTRODUCTION TO ANIMAL PARASITOLOGY by Dr. J. E. Alicata, dates changed from Mondays, Wednesdays and Fridays to Saturdays 1:15 to 3:15, beginning September 21 - Room 226-E Administration Building.

Announcing:

PRINCIPLES OF ECONOMICS (year) Dr. E.W. Braun, Mondays and Wednesdays, beginning September 16, Room 6554, South Building, 4:45 to 5:45 p.m. Second semester begins Monday, January 13, 1936.

This course will be designed to serve two types of students:

I. Students who wish a foundation for advanced economic theory.
II. Students who wish to link quantitative analysis with economic principles.

Emphasis will be placed upon the relation between economic principles or tendencies and frequency distributions, time series including index numbers.

The first semester will be devoted to questions relating to value. Illustrative material will be drawn mainly from agricultural economics, and the second semester will be devoted to a treatment of distribution. To the extent that time permits different concepts of distribution will be examined.

GRADUATE SEMINAR IN GENERAL ECONOMICS

(Year) Beginning, Friday, September 27. Conference in Room 4092, South Building for completion of arrangements. Max J. Wasserman, Chairman.

This Seminar is designed for mature students of Economics who may fall into one of two categories:

(1) Those students who are preparing theses for presentation for Master's or Doctor's Degrees.

(2) Students interested in the discussion of scientific economic questions.

The members of the Seminar will be divided into the following classes:

(1) Faculty consisting of instructors on the Staff of the Graduate School of the United States Department of Agriculture, Instructors of Economics on the Staffs of local Universities, and Economists occupying responsible government positions.

(2) Graduate Students.

The fee for the graduate students will be $1.00 per semester; Chairman and Faculty Members serving without pay. The fee will be used solely for the purpose of covering overhead expense of conducting the course.

The Seminar will meet one evening a week from seven to nine. A definite time will be determined at the first meeting.

The program of each meeting will consist of the presentation of material by graduate students, papers presented by the faculty and graduate students, the reading of articles in preparation by any of the members, and the discussion of fundamental economic questions which present a theoretical interest.

Students interested in this Course should obtain the permission of the Chairman before registering. The names of the members of the faculty, who will be appointed by invitation, will be announced at the first meeting of the Seminar.

OUTLINE OF COURSE IN MONEY AND BANKING

(Year) Dr. Max J. Wasserman. Tuesday and Thursday, beginning September 24, 1935, Room 3065, South Building. This course will treat of the following subjects:

Money: Medium of Exchange, Functions of Money, History of the United States Coinage, Paper Money, The Money System of the United States, Value of Money and Prices, Credit.

Banking: Origin and development of Banking, Banking Development in the United States, Functions of the Bank, National Banking System, Administration, Deposits and Depositors, Clearing House, Domestic and Foreign Exchange, Loans and Discounts, Bank Supervision, Savings Banks, Trust Companys, Foreign Banking Systems, Defects of National Banking Systems, Federal Reserve System.

U. S. Department of Agriculture

Graduate School
Cooperating with the School of Public Affairs, American University.

PERSONNEL MANAGEMENT (one semester). Mr. Peter Keplinger, 5110-A South, Chairman, beginning September 23 on Mondays and Wednesdays at 4:45 P.M. This course is a continuation of the elementary course of last year and is open only to students having completed that course or its equivalent.(*) A similar course will be available in the School of Public Affairs, American University. The two courses will be coordinated and will be conducted cooperatively. The aim is to train students in the effective methods of approach to personnel problems as related to government service. The project and conference methods of instruction will be followed and an attempt will be made to adapt the most progressive methods to public service use.

Projects will be selected that involve problems in employee representation, conciliation committees, employee organizations, employee service programs, training on the job and training for advancement for worker, supervisor, and executive; position analysis and classification, placement and transfer, career service programs, efficiency determination, performance standards, and studies leading to the development of personnel policy. Fee for the course - $12.00.

(*) The lectures and material covered during the "Elementary Course" have been printed and bound in booklet form and are for sale at 35 cents a copy-- (Check or money order made to Treasurer, Graduate School, U.S.D.A., and sent to A. F. Woods, - no stamps.) in room 4090 South Building, Dept. of Agriculture.

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EXECUTIVE MANAGEMENT AND SUPERVISION (one semester) Mr. Peter Keplinger, 5110-A South, Chairman, beginning January 21 on Tuesdays and Thursdays, at 4:45 P.M. A similar course will be available in American University, School of Public Affairs. The two courses will be coordinated and conducted cooperatively. This course aims to train students in effective methods of approach to executive and supervisory problems as related to government business. It is not a study of standard procedures now in use in government departments but a study of principles and trends, drawing freely on the experience and the literature of industry as well as of the government.

The project method will be followed. Projects will be selected in the fields of organization, problem analysis leading to executive decision, training, and production control, including job analysis, standardization, job specifications, work planning, and measure of performance. Prerequisites: Training or experience for this type of work as determined by conference with Director or Chairman of the course. Fee for the course $12.00.

Amendment #1 to Educational Courses for 1935-36 - page 8 -

Colloid Chemistry - Dr. Malcolm M. Haring.

In addition to the alternates mentioned under this head Advanced Physical Chemistry, three hours per week Monday, Wednesday and Friday, will be given if more requests are received for it than for the courses mentioned.

ELEMENTARY STATISTICAL METHODS (year).-- B. R. Stauber and F. J. Hosking.

This course consists of two halves, Elementary Statistics 1 and Elementary Statistics 2 described below, which together constitute a year's work. A course in Elementary Statistics 2, the second half, is offered in the fall semester, for students who took the first half last spring, or who have had the equivalent. Students completing Elementary Statistics 1 during the fall semester will continue Elementary Statistics 2 during the spring.

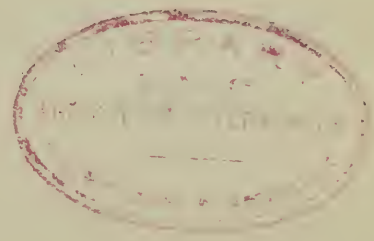
Elementary Statistics 1. Elementary Statistics, First half. Monday and Wednesday. Beginning September 23, Room 2050, South Building, 4:40 p.m.-- This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs andthe use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Elementary Statistics 2. Elementary Statistics, Second half. Prerequisite E. S. 1, or equivalent. Fall semester, Tuesday and Thursday, beginning September 24, Room 6554, South Building. Spring semester, Monday and Wednesday beginning January 13, Room 2050, South Building, 4:40 p.m. This will be a continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and an introduction to the concept of variance analysis in relation to correlation.

GRADUATE SCHOOL
U. S. Department of Agriculture

Library Course 1935

I.	Sept. 24.	Introduction - Scope of Library - Organization of Library - Principal records - Relation to other libraries
II.	Oct. 1.	Classification and catalogue of the Library. Miss Thompson
III.	Oct. 8.	Catalogue of the Library (continued). Miss Hawks
IV.	Oct. 15.	U. S. Department of Agriculture publications. Miss Knoop
V.	Oct. 22.	Government documents - Book trade catalogues. Miss Wilson
VI.	Oct. 29.	Dictionaries and encyclopaedias - General aids. Mrs. Watrous
VII.	Nov. 5.	Special reference books. Miss Bien
VIII.	Nov. 12.	Periodicals and indexes to them. Miss Wilkins
IX.	Nov. 19.	Agricultural economics - Literature and indexes. Miss Lacy
X.	Nov. 26.	Sciences - Chemistry, botany, entomology, biology and zoology - Literature and indexes. Miss Hawks
XI.	Dec. 3.	Engineering, forestry, home economics - Literature and indexes. Miss Hawks
XII.	Dec. 10.	Legislation under which Department operates. Miss Lacy
XIII.	Dec. 17.	Biblio-Film Service - Translations. C. E. Wright and C.R.Barnett



UNITED STATES DEPARTMENT OF AGRICULTURE

LIBRARY

WASHINGTON, D. C.

OFFICE OF THE LIBRARIAN

21 October 1935

Miss Mary G. Lacy,

Librarian, Bureau of Agricultural Economics.

Dear Miss Lacy:

As you know, the Library is now giving a course in connection with the Graduate School on the use of the Library. Enclosed is a list of the lectures thus far given and a tentative list of the lectures to be given later. You will note that in the latter group, no. IX on November 19 is planned for the talk on agricultural economics literature, and no. XII, on December 10, for the talk on the legislation under which the Department operates. I shall appreciate it very much if you will give these two.

Very sincerely yours,

C. R. Barnett

Librarian.

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A COURSE OF LECTURES
BY THE GRADUATE SCHOOL

Arrangements have been made for a course of special lectures for students of the Graduate School and others interested. The lecturers are leaders in their respective fields and what they will have to say will be of special import to those interested in the advancement of research in agriculture.

The lectures will be as follows:

(1) February 1--Scientific Method in Economic Research, by E. B. Wilson, President of the Social Science Research Council.

(2) February 8--Evaluating Institutions as a Factor in Economic Change, by J. R. Commons, University of Wisconsin.

(3) February 15--Fact Interpretation in Economics, by F. H. Knight, University of Chicago.

(4) February 21--Experience in Stabilizing Price Levels, by E. A. Goldenweiser, Federal Reserve Board.

(5) March 1--Methods of Analysis in Agricultural Economic Research, by J. D. Black, Harvard University.

(6) March 15--Efforts and Achievements in Directing Economic Activities in Agriculture, by E. G. Nourse, Institute of Economics.

The lectures will begin at three o'clock, the first one to be given in Room 411 of the Bieber Building and the five subsequent lectures in the Auditorium of the United States National Museum.

There will be no charge for these lectures and all are invited.

A. F. Woods,
Director of Scientific Work.

U. S. DEPARTMENT OF AGRICULTURE

Graduate School

BASIC PHOTOGRAPHY

Basic Photography. (one semester). Mr. C. H. Hanson and other specialists. Two periods a week beginning Monday, November 4, 1935. Register in Dr. A. F. Woods' Office, Room 4090 South Building. The course will be held in Room 4407 South Building. Time: 4:50 p.m.

There are no special prerequisites. The fee for the course is $12.00. Registration by mail should be accompanied by check or Post Office money order for $12.00.

If there is sufficient demand from qualified professional and advanced scientific workers for seminar courses, the Graduate School will endeavor to arrange for such courses during the second semester.

The course will be elementary and basic in character and will be designed to meet the needs of the amateur. Text: Air Corps Training Manual No. 2170-5, "Basic Photography". For sale by the Superintendent of Documents - price 50 cents.

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TENTATIVE OUTLINE OF THE COURSE IN BASIC PHOTOGRAPHY

Date	No. of Lecture	Subject	Lecturer	Service
11-4-35	1	Elementary photographic optics.	C.H. Hanson	Extension
11-6-35	2	Selection and use of photographic lenses.	C.H. Hanson	Extension
11-11-35	3	Careras and shutters	F.M. Blake	Information
11-13-35	4	Films and plates.	Raymond Davis	Bureau of Standards
11-18-35	5	The photography of colored objects	F.H. Wildung	National Geographic Society
11-20-35	6	Exposure	C.H. Hanson	Extension
11-25-35	7	An outline of elementary chemistry	Dr. Wm.B.Holton	American Univ.
11-27-35	8	Elementary Photographic chemistry	Dr. Wm.B.Holton	American Univ.
12-2-35	9	Preparing solutions	Dr. Wm.B.Holton	American Univ.
12-4-35	10	Darkroom arrangement, conveniences and practices	F.M. Blake	Information

(over)

Date	No. of Lecture	Subject	Lecturer	Service
12-9-35	11	Developers and development	To be arranged	
12-11-35	12	The technique of developing roll films, film packs and plates.	F.M. Blake	Information
12-16-35	13	Defects in negatives	E.C. Purdy	"
12-18-35	14	The science of printing	F.H. Wildung	National Geographic Society
1-6-36	15	The practice of printing	F.H. Wildung	"
1-8-36	16	The camera in use	E.C. Crandall	Soil Conservation
1-13-36	17	Selection and arrangement of the subject	C.H. Hanson	Extension
1-15-36	18	How to tell a story	G.W. Ackerman	"
1-20-36	19	Outdoor photography	E.L. Crandall	Soil Conservation
1-22-36	20	Enlarging papers, equipment and devices	F.H. Wildung	National Geographic Society
1-27-36	21	How to make enlargements	F.H. Wildung	"
1-29-36	22	Finishing photographic prints	H.C. Wilcox	Agr. Economics
2-3-36	23	Miniature camera photography	To be arranged	
2-5-36	24	Photography with artificial light	F.M. Blake	Information
2-10-36	25	Home portraiture	F.S. Knoblock	"
2-12-36	26	Lighting and posing in portraiture	A.B. Cornish	Eastman Kodak Co.
2-17-36	27	Indoor photography	To be arranged	
2-19-36	28	Line work and copying	F.M. Blake	Information
2-24-36	29	Color photography	F.H. Wildung	National Geographic Society
2-26-36	30	Amateur motion picture cameras, equipment and materials.	G.R. Georgens	Extension
3-2-36	31	How to take amateur motion pictures	G.R. Georgens	"

NEW COURSES AVAILABLE IN THE U.S.D.A. GRADUATE SCHOOL BEGINNING, JANUARY, 1936

A detailed announcement of courses will be available for distribution December 15. Special attention is called to the new courses offered.

ENGLISH GRAMMAR AND COMPOSITION.--Two hours a week for a year providing a thorough review of the fundamentals of grammar and sentence analysis and a study of good English usage. Dr. Homer C. House, Head of the Dept. of English Language and Literature of the University of Maryland will be in charge of the course. He is senior author of one of the best college texts on the subject and a well known writer.

ADVANCED SURVEY COURSES are offered in several fields of Plant Science:

1. PLANT CYTOLOGY by Dr. Ronald Bamford, Cytologist of the Department of Botany, University of Maryland. A worker of distinction in this field. Two hours a week for one semester will be devoted to this course.

2. PLANT BIOPHYSICS by Dr. Glenn A. Greathouse, University of Maryland, two hours a week for one semester followed by a course in Plant Physiology beginning next fall continuing for a year, two hours a week. Dr. Greathouse is an outstanding teacher in this field.

3. PLANT BIOCHEMISTRY, by Dr. M. W. Parker, University of Maryland, two hours a week for one semester. This course is designed especially for those doing research in this field. Dr. Parker is an outstanding worker in this field.

4. AN ADVANCED COURSE IN PERSONNEL MANAGEMENT AND SUPERVISION in cooperation with American University will be given three hours a week by Dr. Olson and Mr. Keplinger, both recognized leaders in this kind of work. A special announcement will be available early in January regarding this course.

5. Beginning in April the course of 10 lectures in - ELEMENTS OF PERSONNEL ADMINISTRATION will be repeated. Several hundred had to be turned away from this course last April. It is offered especially for their benefit. Mr. Keplinger will be chairman of the course.

6. A one semester course in FOOD SELECTION FOR GOOD NUTRITION, two hours a week, under the direction of two outstanding experts, Dr. H. E. Munsell and Dr. H. K. Stiebeling of the Bureau of Home Economics.

7. A special course on DEPARTMENT OF AGRICULTURE OBJECTIVES will begin January 10. This course is free to Department workers, but registration is required due to the limited capacity of the auditorium. A special announcement regarding this course may be had on application to the Director of the Graduate School.

8. Beginning section in ELEMENTARY STATISTICS will be available.

9. A course in SOILS MORPHOLOGY, GENESIS AND CLASSIFICATION starts December 16. Dr. Charles E. Kellogg who will give the course succeeded Dr. Marbut as Chief of Soil Survey.

10. ADMINISTRATIVE LAW, two hours a week and CONTRACTS, two hours a week. Both courses under direction of Elmer D. Hays, Office of Solicitor.

PLEASE POST FOR EMPLOYEES' INFORMATION.

U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
1936-37 Supplement No. 1.

The following courses are in addition to those listed in the Graduate School prospectus for 1936-37:

ADVANCED INORGANIC ANALYTICAL CHEMISTRY: (year). Tuesdays and Thursdays, beginning September 15 at 5:00 P.M. in Room 4090 South Building. Instructor: Dr. James I. Hoffman.

During the first semester a study will be made of solvents and fluxes, and the composition, classification, and segregation of materials. This will be followed by a careful study of the general scheme of rock analysis and the application of common and special reactions in analytical procedures.

The work in the second semester will cover volumetric analysis, organic reagents used in inorganic analyses, and diagrammatic outlines of procedures used in the analysis of selected materials. The evaluation of results and a discussion of probable and reasonable errors will conclude the course.

AGRICULTURAL PRICES (year). Mondays and Fridays, beginning September 14 at 4:50 P.M. in Room 4090 South Building. Instructor: Dr. F.L. Thomsen.

First semester.--Uses of price information. Basic concepts of demand, supply and price. Statistical measurement of changes in prices and related factors. Relation between agricultural commodity prices and the "general price level." Time elements in prices. Relation between cash and futures prices. A summary and evaluation of specific methods of price analysis and forecasting, including graphic multiple correlation and "price formations." Sources of data used in price analysis and forecasting. Outlook work.

Second semester.--Application of the foregoing principles in the analysis of specific price problems, explanation of factors responsible for specific types of price situations, proposed solutions of the "surplus problem," anticipating the effects of marketing agreements and other marketing reforms. A study of factors affecting the prices of the principal farm products, using the methods of analysis learned during the first semester.

Prospective students should have some knowledge of elementary statistics. No effort will be made to teach the details of technical statistics. The course is designed to bring the student up to date regarding the important contributions to the knowledge of agricultural prices which have been made in recent years, and not to develop expert statistical analysts.

GEOGRAPHY OF AGRICULTURE (year). Mondays and Wednesdays, beginning September 14 at 5:00 P.M. in Room 4090 South Building. Instructor: Lyle Rexford Fletcher. A survey course in the geography of agriculture. The first semester will be devoted to geographic fundamentals, the second to a consideration of agricultural geography in the U. S.

First semester.--The field of geography. Elements of physical geography influencing the agricultural activity of man. Population distribution and its agricultural significance. Geophysics and geomorphology. Soils. Map interpretation. Climates of the U.S. The land and its utilization.

Second semester.--The agricultural regions of North America. These regions will be studied from the standpoint of climate, soils, topography, agricultural production, systems of farming, land tenure, people. Special lectures at the close of the semester will concern the more important farm crops, the future of farming in theU.S. from the geographical viewpoint and attention will be given to the probable affects of government policies toward agriculture.

PHASE RULE (one semester). Tuesdays and Thursdays, beginning September 15 at 4:50 P.M. in Room 4090 South Building. Instructor: Dr. O.A. Nelson.

A study of heterogeneous equilibria -- The application of Phase Rule to one, two and three component systems, also reciprocal salt pairs, and a brief consideration of four component systems, with practical application of each.

COLLOIDS (year). Mondays and Wednesdays, beginning September 14 at 4:50 P.M. in Room 4090 South Building. Instructor: Dr. O. A. Nelson.

First semester.--Theory and general considerations.
Second semester.--Practical applications.

DEVELOPMENTAL HISTORY OF AMERICAN AGRICULTURE (year) Tuesdays and Thursdays beginning September 15 at 4:50 P.M. in Room 4090 South Building. Instructor: Dr. Carleton R. Ball (more than thirty years with Dept. of Agriculture and recently with the Bureau of Public Administration, University of California.)

The course will be given from three integrated points of view, namely: Historical, or the sequential development of agriculture; Sociological, or the cause and effect of human motivation; and Governmental, or the origin and development of the official agricultural agencies, Federal, State, and County. The material will cover four periods.

1. Colonial: including perspective on agriculture and American life; European and American influences; the crops, livestock, and implements; use, barter, and sale of products; geographic expansion, and popular and governmental attitudes.

2. Transition, 1784-1860: including Federal and State land and other natural-resource policies; agricultural organizations and their influence; agricultural education in all forms; improvement of crops and livestock and of farm implements and machinery; the evolution of transportation, manufacture, trade, and commerce; sectional developments; and Federal-State organizations, attitudes, and relations.

3. Commercial Agriculture:, 1861-1920: including Federal land policies (homestead laws, railroad and school land grants); forest and mineral policies, exploitation, and frauds; evolution of the U. S. Dept. of Agriculture through its developmental and organization periods; evolution of the colleges of agriculture in teaching, research and popular education; frontier, immigration, and population shifts; depressions, monopolies, and revolts; farmer national and regional organizations and evolution of cooperation; large-scale machinery and farms; evolution of regulatory sentiment, legislation, and activities; and evolution of conservation attitudes and legislation.

4. Agricultural Readjustment: including Remote Causes of Agricultural Maladjustment (vanishing frontier, submarginal lands, population trends, mechanization, land values, tariffs, regional competition, and erosion); Immediate Causes of Agricultural Crisis (war expansion, lost markets; increasing taxes, interest, and speculation; falling prices, changes in dietary and textiles, decline in population increase-rate, increasing mechanization, and failure of remedial legislation); and Meeting the Readjustment Problem (land-use classification and planning, soil and water conservation and use, compensated adjustment of acreage and production, adjusted values, debts, and interest rates; and development of recreational uses and revenues).

The following courses are still under consideration:

STATISTICS FOR BIOLOGICAL WORKERS by Dr. W. B. Kemp

SAFETY ENGINEERING by Dr. David J. Price and Mr. P.L. Blake

RECENT DEVELOPMENTS IN ECONOMIC THEORY by Mr. J. Wadleigh -1937-38

LANDSCAPE ARCHITECTURE by Mr. F. L. Mulford.

USDA

GRADUATE SCHOOL FLYER

USDA

APR 14 1936

REGISTRATIONS are now being taken for courses in the GRADUATE SCHOOL of the Department of Agriculture. Information may be secured from Dr. A. F. Woods, Director of the Graduate School, Room 4090 South Bldg., Branch 2117.

LIBRARY

CURRENT ECONOMIC PROBLEMS II

RELATION OF GOVERNMENT TO ECONOMIC LIFE

Chairman, Dr. M. L. Wilson, Assistant Secretary of Agriculture

This course will consist of a series of lectures on contemporary economic problems and should prove to be valuable and stimulating to everyone who takes the course. Classes will be held on Saturdays at 2 PM except for 3 or 4 which will be held on Thursdays. Every attempt will be made to wind up the course by June 6.

The following outstanding speakers have already accepted: Thomas C. Blaisdell, Jr., Gardiner C. Means, Ernest Minor Patterson, E. A. Goldenweiser, H. Parker Willis, E. G. Nourse, Morris L. Cooke, Charles W. Eliot II, Joseph B. Eastman, Robert L. O'Brien, Philip M. Glick, and Clarence E. Ayres. A program giving the dates of the talks and the topics to be covered can be secured from the Graduate School.

IMMEDIATE REGISTRATION is urged as this course starts Saturday, March 7, at 2 PM. A special registration will be held at the auditorium Saturday. The auditorium is now air-conditioned and when the weather becomes warm the air-cooling system will be put into operation. THE FEE FOR ANY 5 LECTURES IS $2.00 and the 15 lectures are $5.00. If credit for the course is desired, the fee will be $9.00. Special seminars will be held for those taking the course for credit.

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ECONOMICS IN FRENCH

Conducted by Dr. Walter Bauer

This course is designed to aid students in the social sciences, particularly economic majors, to secure a good reading knowledge of this language in their specialty. Persons who are desirous of securing their doctorate will recognize this course as of great value in this connection. Dr. Bauer is conducting the language examinations for Harvard University this week in both German and French, which will give some indication to prospective students of the value of these courses. Classes will be held at room 2349, Tuesdays, 7:30 to 9:30 Pm., starting March 10. The fee for the course is $12.00.

OVER

LANDSCAPE ARCHITECTURE
(Gardening)

This course will cover landscape design of various types, and will begin on Wednesday, March 4 and continue for 30 lectures on Wednesdays and Fridays thereafter at 4:50 p.m., in room 4092 South Building, U.S.D.A. The lectures will be illustrated by lantern slides and other illustrative material, and will cover the treatment of walks and drives in connection with homes, small farms, residential grounds, public buildings, parks, etc.; service and ornamental features connected with home grounds, including service yard and laundry yard; lawns, garden design and planting, garden accessories, water gardens, rockeries, the use of trees, shrubs, vines and herbacious plants.

The lectures will be given by the best obtainable experts in each subject. Among the lecturers will be B. Y. Morrison, F. L. Mulford, Joseph C. Gardiner, John Paolano, A. H. Hanson, Geo. B. Gordon, W. H. Simonson and Mrs. L. Helen Fowler.

THE COURSE IS OPEN TO ALL INTERESTED IN THE SUBJECT - FEE $12.00

SHORTHAND SPEED CLASS
Conducted by Clara Richter

This speed class in shorthand has been started in the School to provide a means for the many stenographers in the Department of Agriculture to develop and hold their speed. There will be speed drills and general training in both Gregg and Pittman. Persons contemplating joining this class should be able to write at least 100 words or more a minute at present.

At the completion of the course, the Department will arrange for a non-competitive examination for reporting-stenographer at the Civil Service Commission. Ratings secured by those taking this examination will be made a matter of record at the Commission. Successful candicates should have a good opportunity to be considered for reporting positions not only in Agriculture but throughout the Government.

Classes will be held on Tuesdays and Thursdays at 4:50 p.m. in Room 4613 South Building; starting March 10. The fee for the course is $12.00.

ELEMENTS OF PERSONNEL ADMINISTRATION
Chairman, Peter Keplinger

This course will consist of a series of 10 lectures by specialists in various fields of personnel administration. It will be similar to the very successful course taught last spring but will include some different lecturers and subjects.

Lectures will be held on Fridays at 5 p.m. in the Department of Agriculture auditorium starting April 3. The fee for the course is $5.00.

OVER

DEPARTMENT OF AGRICULTURE
WASHINGTON

April 22, 1936

GRADUATE SCHOOL
COURSE in
ELEMENTS OF PERSONNEL ADMINISTRATION

Fellow Worker:

Last year you were enrolled in our Graduate School course in Personnel Administration. Our objective in the course was to try to make personnel administration contribute more toward making the Government service an enjoyable and satisfying place to work. I think the course did contribute something and that there is now definitely a movement in that direction. I am sure that you received from the lectures much of inspiration, and an understanding of the relations that should exist between the individuals of an organization, as well as some of the things that you, yourself, can do to further the objective of the course.

This year we are offering a similar course of lectures and are again trying to secure only nationally known men. To do this, however, involves considerable expense. The enrollment so far will not meet it. If you still believe in the objectives of the course and that our lecture method has merit, will you not help us to increase our enrollment? Dr. Woods has agreed to accept enrollments for the remaining lectures on a pro rata basis. Only three lectures have so far been given.

Will you please call the opportunities of the course to the attention of such of your friends as may be interested?

PETER KEPLINGER,
Course Chairman.

GRADUATE SCHOOL FLYER

JUN 8 1936

Current Economic Problems II ,

RELATION OF GOVERNMENT TO ECONOMIC LIFE

Department of Agriculture Auditorium

Date	Speaker	Subject
March 7, Sat. 2 P.M.	Thomas C. Blaisdell, Jr., Economic Adviser to Administrator of Resettlement Administration	INTRODUCTION
Mar. 14, Sat. 2 P.M.	Gardiner C. Means, Director, Industrial Section, National Resources Committee	BUSINESS CORPORATIONS
Mar. 28, Sat. 2 P.M.	E. A. Goldenweiser, Director, Division of Research and Statistics, Federal Reserve System	MONETARY CONTROL I
Apr. 4, Sat. 2 P.M.	H. Parker Willis, Professor of Banking, Columbia University	MONETARY CONTROL II
Apr. 11, Sat. 2 P.M.	E. G. Nourse, Director, Institute of Economics, Brookings Institute	AGRICULTURE
Apr. 16, Thur. 8 P.M.	Morris L. Cooke, Administrator, Rural Electrification Administration	POWER
Apr. 18, Sat. 2 P.M.	Ernest Minor Patterson, Professor of Economics, University of Pennsylvania	TAXATION
Apr. 23, Thur. 8 P.M.	Charles W. Eliot II, Executive Officer and Director of the National Resources Committee	RESOURSES
Apr. 25, Sat. 2 P.M.	David J. Sapos, Head, Statistical Division, National Labor Relations Board	LABOR
May 2, Sat. 2 P.M.	Joseph B. Eastman, Federal Coordinator of Transportation	TRANSPORTATION
May 9, Sat. 2 P.M.	Robert L. O'Brien	INTERNATIONAL ECONOMIC RELATIONS
May 14, Thurs. 8 P.M.	Ernest S. Griffith, Dean of Graduate School, American University	SOCIAL SECURITY
May 16, Sat. 2 P.M.	Philip M. Glick, Chief, Land Policy Section, Office of Solicitor, Dept. of Agriculture	LEGAL BASIS OF BUSINESS REGULATION
May 23, Sat. 2 P.M.		MONOPOLY
June 6, Sat. 2 P.M.	Clarence E. Ayres, Director, Consumers Division, Department of Labor	CONSUMPTION

FEE FOR ANY 5 LECTURES IS TWO DOLLARS

FEE FOR ANY 2 LECTURES IS ONE DOLLAR

Register at Room 4090 South Building, Department of Agriculture, or at the Auditorium at the time of the lecture.

Purpose of the lectures is to stimulate interest in contemporary economic problems.

OVER

GRADUATE SCHOOL FLYER

ELEMENTS OF PERSONNEL ADMINISTRATION

Department of Agriculture Auditorium

Date (Fridays 5 P.M.)	Speaker	Subject
April 3	Whiting Williams Author and Consultant	INTRODUCTION
April 10	William E. Mosher Syracuse University	THE ART OF MANAGEMENT AND ITS RELATION TO PERSONNEL ADMINISTRATION
April 17	Boyd Fisher Rural Electrification Administration	NON-FINANCIAL INCENTIVES
April 24	Harry Farquhar Forest Service	THE TECHNIQUES OF SUPERVISION
May 1	James H. Greene Author and Consultant	EMPLOYEE TRAINING
May 8		EMPLOYEE REPRESENTATION
May 15		THE RELATION OF PROFESSIONAL PERSONNEL ADMINISTRATION TO THE CAREER SERVICE IDEA
May 22		PSYCHIATRY - APPLICATION TO THE FEDERAL SERVICE
May 29		COMPLAINTS, CONCILIATION AND DISCIPLINE
June 5	Carleton R. Ball Executive Secretary, Coordinating Committee, U.S.D.A., T.V.A., and Land Grant Colleges	SUMMARY - HOW INFORMATION GAINED CAN BE USED TO BETTER THE FEDERAL SERVICE

Purpose of this course is to introduce government employees to the science of personnel administration and to stimulate more general interest in the subject.

Register at Room 4090 South Building or at the Auditorium at the time of the lecture.

FEE FOR ANY 2 LECTURES IS ONE DOLLAR

This course as well as the one in Current Economic Problems is given by the Department of Agriculture Graduate School in cooperation with American University.

OVER

U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
1936-37

The general circular of information relative to courses of instruction available in the Graduate School of the U. S. Department of Agriculture for year beginning September 14, 1936, may be obtained upon request by sending name and address to Eva M. Johnson, Secretary, Graduate School, 4090 South Building, U. S. Department of Agriculture. They include the following:

1. Survey of Public Personnel Management * (*) (In cooperation with
2. Management and Supervision * American University)
3. Department Personnel Problems *
4. The Library, Its Organization and Use
5. Special Series of Lectures on Department of Agriculture Objectives
6. Administrative Law
7. Federal Jurisdiction and Procedure
8. History of Economic Thought
9. History of American Agriculture
10. Graduate Seminar in General Economics
11. Contemporary Economic Problems
12. Wages and Economic Insecurity
13. The Rise of Modern Industrialism in the United States
14. The Evolution of Economic Institutions
15. Principles of Economics
16. Principles of Accounting
17. Advanced Statistical Analysis
18. Elementary Statistical Methods
19. International Trade
20. Adjustment of Observations
21. Mathematical Preparation for Statistics
22. Differential Equations and Applications
23. An Introduction to Organic Chemistry
24. Food Selection for Good Nutrition
25. Soils: "Their Morphology, Genesis and Classification
26. Glass Blowing
27. Microscopic Technique and Histology
28. Plant Ecology
29. Plant Diseases with Special Reference to Cause and Control
30. Systematic Botany
31. Extension Seminars
32. Extension Theses
33. English Grammar and Composition
34. Editing Manuscripts on Agriculture, Home Making and Related Subjects
35. Elementary Scientific French
36. Advanced Scientific French
37. Elementary German
38. Scientific German
39. Elementary Russian
40. Advanced Russian
41. Elementary Spanish
42. Advanced Spanish
43. Scientific and Technical Spanish
44. Elementary Italian
45. Advanced Italian
46. Technical Shorthand Speed Writing.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

A. F. Woods
Director, Graduate School

OCT 21 1936

U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
1936-37 Supplement No. 1.

The following courses are in addition to those listed in the Graduate School prospectus for 1936-37:

ADVANCED INORGANIC ANALYTICAL CHEMISTRY: (year). Tuesdays and Thursdays, beginning September 15 at 5:00 P.M. in Room 4003 South Building. Instructor: Dr. James I. Hoffman.

During the first semester a study will be made of solvents and fluxes, and the composition, classification, and segregation of materials. This will be followed by a careful study of the general scheme of rock analysis and the application of common and special reactions in analytical procedures.

The work in the second semester will cover volumetric analysis, organic reagents used in inorganic analyses, and diagrammatic outlines of procedures used in the analysis of selected materials. The evaluation of results and a discussion of probable and reasonable errors will conclude the course.

AGRICULTURAL PRICES (year). Mondays and Fridays, beginning September 14 at 4:50 P.M. in Room 3863 South Building. Instructor: Dr. F.L. Thomsen.

First semester.--Uses of price information. Basic concepts of demand, supply and price. Statistical measurement of changes in prices and related factors. Relation between agricultural commodity prices and the "general price level." Time elements in prices. Relation between cash and futures prices. A summary and evaluation of specific methods of price analysis and forecasting, including graphic multiple correlation and "price formations." Sources of data used in price analysis and forecasting. Outlook work.

Second semester.--Application of the foregoing principles in the analysis of specific price problems, explanation of factors responsible for specific types of price situations, proposed solutions of the "surplus problem," anticipating the effects of marketing agreements and other marketing reforms. A study of factors affecting the prices of the principal farm products, using the methods of analysis learned during the first semester.

Prospective students should have some knowledge of elementary statistics. No effort will be made to teach the details of technical statistics. The course is designed to bring the student up to date regarding the important contributions to the knowledge of agricultural prices which have been made in recent years, and not to develop expert statistical analysts.

GEOGRAPHY OF AGRICULTURE (year). Mondays and Wednesdays, beginning September 14 at 5:00 P.M. in Room 4090 South Building. Instructor: Lyle Rexford Fletcher. A survey course in the geography of agriculture. The first semester will be devoted to geographic fundamentals, the second to a consideration of agricultural geography in the U. S.

First semester.--The field of geography. Elements of physical geography influencing the agricultural activity of man. Population distribution and its agricultural significance. Geophysics and geomorphology. Soils. Map interpretation. Climates of the U.S. The land and its utilization.

Second semester.--The agricultural regions of North America. These regions will be studied from the standpoint of climate, soils, topography, agricultural production, systems of farming, land tenure, people. Special lectures at the close of the semester will concern the more important farm crops, the future of farming in the U.S. from the geographical viewpoint and attention will be given to the probable affects of government policies toward agriculture.

PHASE RULE (one semester). Tuesdays and Thursdays, beginning September 15 at 4:50 P.M. in Room 1147 South Building. Instructor: Dr. O.A. Nelson.

A study of heterogeneous equilibria -- The application of Phase Rule to one, two and three component systems, also reciprocal salt pairs, and a brief consideration of four component systems, with practical application of each.

COLLOIDS (year). Mondays and Wednesdays, beginning September 14 at 4:50 P.M. in Room 4090 South Building. Instructor: Dr. O. A. Nelson.

First semester.--Theory and general considerations.
Second semester.--Practical applications.

The following courses will be offered upon request:

SAFETY ENGINEERING by Dr. David J. Price and Mr. P.L. Blake

LANDSCAPE ARCHITECTURE by Mr. F. L. Mulford.

UNITED STATES DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

1936

THE ECONOMICS OF INSTABILITY (one semester) Mondays, beginning October 5 from 7 to 9 P.M. in Room 201 Administration Building. Instructors: Dr. Mordecai Ezekiel and Dr. Louis H. Bean.

1. A critical examination of the laws of supply and demand with reference to the development of the theory of economic cycles under the normal operation of that law, and a comparison of this theoretical restatement with previous economic theory and statistical investigations.

2. An examination of the number of industries showing more or less continuous instability or cycles in the light of the theoretical principles developed, including both agricultural industries, such as hogs, cattle, sheep, and cotton, and non-agricultural industries such as ship-building, automobiles, clothing, etc.

3. The course would conclude with a consideration of the prevalence of cycles or instability in various types of industry, its relation to business cycles, and its effect on the economy as a whole.

Prerequisite: An M.A. degree in economics.

over

UNITED STATES DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

[Announcement of courses]

OCT 21 1936

ADVANCED ORGANIC CHEMISTRY (year) Tuesdays and Fridays, beginning September 15, at 4:50 P.M. in Room 1137 South Building. Instructor: Dr. H. L. Haller.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins and sex hormones will be given. An elementary course in organic chemistry or its equivalent is a prerequisite.

PLANT BREEDING WITH SPECIAL REFERENCE TO DISEASE RESISTANCE (One semester). Mondays and Wednesdays, beginning October 12, at 4:50 P.M. in Room 4622 South Building. Instructor: Dr. F. J. Stevenson, assisted by other specialists. Prerequisite: B. S. Degree. This course will be given from the genetic standpoint. Pathological aspects will be incidental.

Part I. General review of fundamental genetics with illustrations relating to disease resistance in plants. (12 lectures).

Part II. Discussion of special disease resistance problems with respect to (1) genetical basis of inheritance, (2) factors affecting expression of resistance, (3) biologic strains of the organism, and (4) related problems of yield, quality, etc. (19 lectures).

Resistance to rust diseases -- wheat, oats, rye, beans;
Resistance to smut diseases -- wheat, oats, corn;
Resistance to fusarium diseases -- cotton, flax, pea, cabbage, tomato, watermelon;
Resistance to virus diseases -- sugar beet, sugar cane, potato, cucumber, bean, tobacco, raspberry;
Resistance to bacterial diseases -- pear, bean, cucumber, sweet corn;
Resistance to miscellaneous diseases, such as --

- Grape phylloxera
- Potato blight, wart, and scab,
- Sugar beet leaf spot
- Bean anthracnose
- Nematode
- Strawberry leaf spot

Final lecture -
Summarization of technique and major objectives.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year). -- Dr. W. B. Kemp. Monday, 2 hours, beginning October 12, at 5 P.M. in Room 2911 South Building.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text R.A. Fisher, Statistical Methods for Research Workers (also other assignments). Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

over

GRADUATE SCHOOL

U. S. DEPARTMENT OF AGRICULTURE

SPECIAL SERIES OF LECTURES ON DEPARTMENT OF AGRICULTURE OBJECTIVES

Fridays - Beginning October 9 to December 18, inclusive.
5 to 6 P.M.
R-E-V-I-S-E-D S-C-H-E-D-U-L-E
Auditorium - South Building
A. F. Woods, Chairman.

With the approval of the Secretary of Agriculture, the Graduate School is offering a special course in Department of Agriculture Objectives.

The course will be based on a series of lectures, more or less overlapping but each looking at the Department from a broad public viewpoint. The purpose, however, will not be "publicity" or "propaganda." It will be a serious attempt to instruct employees and help them to orient themselves in relation to their work and to society. The lectures will deal with objectives, not work programs; they will emphasize not what we are doing, but where we are going.

Employees have said that they want to know "what it is all about;" they want to know and should know, the purpose of the work they are doing--just how it contributes to public welfare. The stenographer, the file clerk, the machine operator, each should know the ultimate purpose of the work they are doing and how their work contributes to the desired end. They should know and feel the importance and the usefulness of their particular job and just how it contributes to the public good. This develops greater interest and satisfaction all around.

Subjects for General Lectures

Dr. C. W. Warburton, Director of Extension Service (October 9)

1. Extension Service Objectives.

Dr. Carleton Ball, Exec. Secy. of Coordinating Comm.T.V.A. & U.S.D.A. (October 16)

2. History of the Department and the development or growth of its objectives.

Dr. Albert G. Black, Chief, B.A.E. (October 23)

3. Economic objectives -- the place of the Department in the American economic system and the ideals toward which it is working.

Mr. Milton S. Eisenhower, Chief, Office of Information (October 30)

4. The organization of the Department -- as a means of carrying out objectives. How and why its form of organization is adapted to its purpose.

Dr. Howard R. Tolley, Administrator A. A. A. (November 6)

5. The future of the Soil Conservation Program.

Dr. W. W. Stockberger, Director Personnel (November 13)

6. Personnel objectives and how they contribute to Department objectives.

Dr. John R. Mohler, Chief, B.A.I. (November 20)

7. Scientific -- Why the scientific research and its general purpose. Why and how it contributes to the general public.

Mr. M. G. White, Solicitor (November 27)

8. The objectives of the regulatory work of the Department.

Dr. Rexford G. Tugwell, Undersecretary of Agriculture (December 4)

9. Conservation and planning the use of land -- what it means and its relation to the nation's future prosperity.

Prof. M. L. Wilson, Assistant Secretary of Agriculture (December 11)

10. The place of the Department in the evolution of agricultural policy.

Hon. Henry A. Wallace, Secretary of Agriculture (December 18)

11. General social and economic objectives of the Department. What we are trying to do for the people of the United States, why it should be done and why it can best be done by centralized effort.

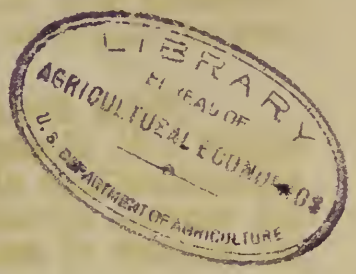
The Graduate School will handle the series of lectures as a general training course. It will enroll applicants, issue admission cards, keep record of attendance, issue library references and such explanatory or correlating material as seems desirable.

The purpose of enrollment is to insure those who start the course that they will be able to continue. The seating capacity of the Auditorium will not accommodate all. The lectures will begin promptly at 5:00 and close at 6:00 P.M. No registration fee will be charged.

APR 14 1937

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON



EDUCATIONAL COURSES - 1936-37

Beginning September 14, 1936

The Graduate School of the United States Department of Agriculture will open the 1936-37 school year the week beginning September 14. Classes will meet in the Department buildings at 4:45 P.M. or as soon thereafter as the students assemble. The tuition will be $12.00 a semester for two hour a week studies and $15.00 a semester for three hour a week studies, except as otherwise indicated. Registration fee for classes discontinued on account of small registration will be returned. Students witndrawing from classes having 15 or less will not be entitled to refund. A $2.00 registration fee is retained in case of withdrawal from continued classes. Cash refunds will not be made after the second week, but credit for the amount will be carried for later registration.

REGISTER IN ADVANCE. No one will be admitted to class without a registration card.

The Congress of the United States has made special provision for making the facilities for study and research in the Government Departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe. (27 statutes 395 and 31 statutes 1010). Under this authority and the provisions of the Organic Act establishing the Department a School of Graduate Studies was organized in 1920 for the benefit of Department employees and such others as are qualified to undertake the work offered.

The work is organized on a standard college basis and certificates of credit for the work accomplished are issued on a standard unit basis. This work has been accepted by graduate schools of accredited colleges and universities wherever it fits in to the approved program of the students.

The plan provides first for work by graduate or advanced students by special arrangement through the graduate schools of accredited colleges with the Graduate School of the Department of Agriculture for the utilization of the available facilities of Government laboratories and collections, in the study of an approved problem under the general supervision of a qualified government specialist.

The second type of work is formal class and laboratory work conducted after 4:30 P.M. or 1 P.M. Saturdays in such subjects as may be helpful to government workers. Everything necessary is done to insure the highest standard of work so that it may be satisfactory to the Government and cooperating colleges.

The Graduate School certifies credits earned. Acceptance, of course, depends on the rules of the college to which the credits are presented. The instructors are selected from the best qualified members of the scientific and professional staffs of the various Bureaus and nearby cooperating colleges. They are, of course, mostly in

the Civil Service and hold their positions by reason of merit. They compare favorably with the staffs of the leading colleges and universities from which most of them were originally drawn.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

Special series of lectures not included in this preliminary statement will be announced from time to time as plans for them are completed.

The latest catalogues of universities and colleges are available for consultation in the Office of the Director, room 4090, South Building. Inquiries regarding the school should be addressed to:

A. F. Woods
Director, Graduate School
U. S. Department of Agriculture
4090 South Building.

INDEX OF COURSES

	Page
Survey of Public Personnel Management	4
Management and Supervision	4
Department Personnel Problems	4
The Library, Its Organization and Use	5
Special Series of Lectures on Department of Agriculture Objectives	5-6
Administrative Law	7
Federal Jurisdiction and Procedure	7
History of Economic Thought	7-8
History of American Agriculture	8
Graduate Seminar in General Economics	8-9
Contemporary Economic Problems	9
Wages and Economic Insecurity	10
The Rise of Modern Industrialism in the United States	10-11
The Evolution of Economic Institutions	11
Principles of Economics	11
Principles of Accounting	12
Advanced Statistical Analysis	12
Elementary Statistical Methods	13
International Trade	13
Adjustment of Observations	13
Mathematical Preparation for Statistics	14
Differential Equations and Applications	14
An Introduction to Organic Chemistry	15
Food Selection for Good Nutrition	15
Soils: "Their Morphology, Genesis and Classification	15-16
Glass Blowing	16
Microscopic Technique and Histology	16-17
Plant Ecology	17
Plant Diseases with Special Reference to Cause and Control	17
Systematic Botany	17
Extension Seminars	17
Extension Theses	17
English Grammar and Composition	18
Editing Manuscripts on Agriculture, Home Making and Related Subjects	18
Elementary Scientific French	18
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Elementary German	19
Scientific German	19
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Elementary Russian	19
Advanced Russian	19
Scientific and Technical Spanish	19
Elementary Spanish	19
Advanced Spanish	19
Elementary Italian	20
Advanced Italian	20
Technical Shorthand Speed Writing	20
Registration Letter	21

*SURVEY OF PUBLIC PERSONNEL MANAGEMENT--Dr. Emery E. Olson

The following is a brief outline of the subject-matter of the course:

I. Historical Background of American Personnel Management
II. Rise and Development of Unions in Public Service
III. Organization of Personnel Administration
IV. General Problems of Recruitment
V. Technique of Testing
VI. Certification
VII. Classification
VIII. Training
IX. Transfer and Promotion
X. Lay Off and Reinstatement
XI. Efficiency Records
XII. Discipline
XIII. Welfare Activities
XIV. Political Activities and Service Ethics
XV. Conciliation Boards and Boards of Review
XVI. Retirement
XVII. Elements of a Career Service

Plan of Instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Classroom discussion under leadership of Dr. Olson.

Two semester hours credit--Fee $15.

*MANAGEMENT AND SUPERVISION--Dr. Emery E. Olson and Mr. Peter B. Keplinger

The following is a brief outline of the subject-matter of the course:

I. Methods of Approach
II. The Relationship of General Organization to Management and Supervision
III. Work-Planning, Scheduling and Follow-Up
IV. Job Analysis and Time Studies
V. Job Specifications
VI. Standard Practice, Instructions, Routine and Procedures
VII. Administrative Control (records, reports, inspection, etc.)
VIII. Coordination and Cooperation (including relationships arising out of line and staff functions)
IX. The Process of Executive Decision
X. Performance Records (group and individual rating scales, unit costs, etc.)
XI. Incentives and Employee Relations
XII. Training
XIII. Bases of Leadership

Plan of Instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Classroom discussion under leadership of Dr. Olson and Mr. Keplinger.

Three semester hours credit--Fee $22.50

* DEPARTMENT PERSONNEL PROGRAMS (One semester) Two hours a week. Time to be arranged in cooperation with American University.

A consideration of personnel policy and practice from the point of view of the department or agency. Fee- $15.00

* In cooperation with American University.

THE LIBRARY, ITS ORGANIZATION AND USE. Tuesdays and Thursdays, beginning September 22 at 4:45 P.M. in Room 1409 South Building. Instructor: Miss Claribel Barnett assisted by library specialists.

This is a non-credit course designed to aid in the understanding and use of the library and library procedures. It will be repeated each semester as long as there is a demand for it. No charge is made for the course. Those admitted will be registered by the Librarian. A certificate of the work accomplished will be issued by the Graduate School.

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A. F. Woods, Chairman

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Subjects for General Lectures

Hon. Henry A. Wallace, Secretary of Agriculture (October 9)

1. General social and economic objectives of the Department. What we are trying to do for the people of the United States, why it should be done and why it can best be done by centralized effort.

Prof. M. L. Wilson, Assistant Secretary of Agriculture (October 16)

2. The place of the Department in the evolution of agricultural policy.

Dr. Carleton Ball, Exec. Secy. of Coordinating Comm.T.V.A. & U.S.D.A. (October 23)

3. History of the Department and the development or growth of its objectives.

Dr. Albert G. Black, Chief B.A.E. (October 30)

4. Economic objectives -- the place of the Department in the American economic system and the ideals toward which it is working.

Agriculture Objectives - continued.

Mr. Chester Davis, Administrator A.A.A. (November 6)

5. The future of the Soil Conservation Program.

Mr. Milton S. Eisenhower, Chief, Office of Information (November 13)

6. The organization of the Department -- as a means of carrying out objectives. How and why its form of organization is adapted to its purpose.

Dr. John R. Mohler, Chief, B.A. I. (November 20)

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Dr. Rexford G. Tugwell, Undersecretary of Agriculture (December 4)

9. Conservation and planning the use of land -- what it means and its relation to the nation's future prosperity.

Dr. W. W. Stockberger, Director Personnel (December 11)

10. Personnel objectives and how they contribute to Department objectives.

Dr. C. W. Warburton, Director of Extension Service (December 18)

11. Extension Service Objectives.

The Graduate School will handle the series of lectures as a general training course. It will enroll applicants, issue admission cards, keep record of attendance, issue library references and such explanatory or correlating material as seems desirable.

The purpose of enrollment is to insure those who start the course that they will be able to continue. The seating capacity of the Auditorium will not accommodate all. The lectures will begin promptly at 5:00 and close at 6:00 P. M. No registration fee will be charged.

ADMINISTRATIVE LAW (one semester) Mondays and Wednesdays, beginning September 14 at 4:50 P.M. in Room 4090 South Building. Instructor: Elmer D. Hays, A.B. and L.L.B.

This course will deal with the separation of powers of the government into (a) legislative power, (b) executive power, (c) Judicial power and (d) admixture of powers, with special emphasis upon the development of administrative agencies, their constitutional and statutory authority, their function, and the control of administrative action by judicial decisions. In broad outline the subject matter to be covered by these lectures will be as follows:

(1) The development and significance of administrative legislation and adjudication.
(2) Advantages and disadvantages of the administrative technique.
(3) Types and forms of administrative authorities.
(4) Technical methods of judicial control of administrative tribunals and regulatory authorities.
(5) The principles of statutory construction.
(6) Constitutional questions involved in the new deal legislation.
(7) The delegation of legislative power to administrative agencies and the validity of departmental regulations issued pursuant thereto.
(8) The Organic Act and regulatory statutes administered by the Department of Agriculture.

FEDERAL JURISDICTION AND PROCEDURE (one semester) Mondays and Wednesdays, beginning January 18 at 4:50 P.M., in Room 4090 South Building. Instructor: Elmer D. Hays, A.B. and L.L.B.

This course will deal with the original and limitations of the jurisdiction of the federal courts; their constitutional and statutory authority and their function in interpreting and developing the constitution, treatise and laws of the United States. In broad outline, the subject matter to be covered by these lectures will be as follows:

(1) The origin and limits of the jurisdiction of the federal courts.
(2) The Supreme Court and its jurisdiction.
(3) History and origin of inferior federal courts.
(4) Civil controversies over which the federal courts have exclusive jurisdiction.
(5) Cases arising under the constitution.
(6) Removal of cases from state to federal courts.
(7) Habeas corpus.
(8) Appelate jurisdiction of the federal courts.

HISTORY OF ECONOMIC THOUGHT. (year) Mondays and Wednesdays, beginning September 21 at 5 P.M. in Room 4649 South Building. Instructor: Dr. Max J. Wasserman.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresmo. The Merchantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Rivere. The Classical School: Adam Smith,

HISTORY OF ECONOMIC THOUGHT -continued

Ricardo, James Mill, Senior, John Stuart Mill: The Solialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Kneis, Hillebrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics -- Veblen, Pigou, J. M. Clark, J. R. Commons, R. G. Tugwell.

HISTORY OF AMERICAN AGRICULTURE (year) Tuesdays and Thursdays, beginning September 22 at 4:50 P.M. in Room 1447-51, South Building. Instructor: Mr. Everett E. Edwards.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic Coast; indigenous and foreign contributions to American agriculture; Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets in the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.--A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1860 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement, rural population and tenancy charges and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

Second semester begins Tuesday, January 19.

GRADUATE SEMINAR IN GENERAL ECONOMICS (year) Fridays, beginning September 25 at 7 P.M. in Room 2050 South Building. Instructor: Dr. Max J. Wasserman.

This Seminar is designed for mature students of Economics who may fall into one of two categories:

(1) Those students who are preparing theses for presentation for Master's or Doctor's Degrees.
(2) Students interested in the discussion of scientific economic questions.

The members of the Seminar will be divided into the following classes:

(1) Faculty consisting of instructors on the Staff of the Graduate School of the United States Department of Agriculture, Instructors of Economics on The Staffs of local Universities, and Economists occupying responsible government positions.

GRADUATE SEMINAR IN GENERAL ECONOMICS - continued.

(2) Graduate Students.

The fee for the graduate students will be $1.00 per semester; Chairman and Faculty Members serving without pay. The fee will be used solely for the purpose of covering overhead expense of conducting the course.

The Seminar will meet one evening.

The program of each meeting will consist of the presentation of material by graduate students, papers presented by the faculty and graduate students, the reading of articles in preparation by any of the members, and the discussion of fundamental economic questions which present a theoretical interest.

Students interested in this course should obtain the permission of the Chairman before registering. The names of the members of the faculty, who will be appointed by invitation, will be announced at the first meeting of the Seminar.

CONTEMPORARY ECONOMIC PROBLEMS (year) Dr. Max J. Wasserman. Tuesdays and Thursdays at 5:00 P.M. in Room 4090 South Building, Beginning September 15. Second semester will begin January 12, 1937.

This course will discuss the theoretical and practical aspects of the major economic problems confronting us at the present time. It will attempt to place each problem in its historical setting showing how it takes its roots in the past developments of economic society; to analyze the economic principles involved in the problem; to evaluate critically the various solutions proposed; and to suggest possible means of its solution. Among the problems which will be treated in the course the following may be cited:

I. Capitalism, Its Improvement and Substitute Economic Organizations.
   A. Necessary reforms in the structural organization of capitalism.
   B. Substitute forms of economic organization: Socialism, Communism, Fascism, and Syndicalism.
II. Problems of the Machine Industry.
III. Tariff in the light of international trade relations.
IV. Monetary reform, banks and the improvement of the credit system.
V. Selected Agricultural Problems:
   A. The adjustment of agricultural prices.
   B. Agricultural tenancy with special reference to sharecroppers.
   C. Problem of sub-marginal land.
   D. Conservation of natural resources.
VI. Selected problems in public finance.
   A. The basis of an equitable tax system.
   B. Growth of the Public debt.
   C. Form of local taxes.
VII. Control of industry and trade.
   A. The Federal Trade Commission.
   B. N.R.A.
   C. Federal incorporation.
VIII. Some problems of unemployment.
IX. Social insurance.
X. Protection of the consumer.
XI. Future of American foreign trade.
XII. Low cost housing for slum clearance.
XIII. Price behavior trends in France.
XIV. Wages and hours of work in selected industries.

WAGES AND ECONOMIC INSECURITY (year) Mondays and Wednesdays, beginning September 14, at 5 P.M. in Room 4603, Instructor: Prof. Edward Berman (Univ. of Illinois) W.P.A.

Wage problems and the insecurity of the worker in modern industry constitute the most important of the many labor problems. This course takes up in its study of wages the following matters: wage levels in various countries, in various industries, and for different kinds of workers; standards of living; and analysis of factors affecting particular wage levels, including an examination of older explanations and of such matters as national wealth, productivity, efficiency, and the supply of labor; wages and business cycles; wages and unemployment; the effect of labor organizations upon wages; the effect of monopoly upon wage levels; the relationship between wage problems and various kinds of legislation; the relationship between wage problems and various kinds of legislation; the relationship between problems of relief and wages; and the wages of selected groups of workers and in selected industries. The consideration of unemployment will be devoted to a discussion of its extent; its various causes; its implications with respect to the status of labor, general business developments, the functions of government, and the economic system; and various remedies suggested for unemployment, including the control of business cycles, the regulation of seasonal production, the organization of the labor market, the manner in which unemployment is affected by relief, unemployment insurance, economic planning, and a greater equalization of the distribution of wealth. Illness, especially as it affects workers, will be discussed from the point of view of the problems of industrial morbidity, the reduction of sickness hazards, and health insurance. Industrial accidents and occupational diseases will be covered from the point of view of their causes, the possibility of reducing them, and the methods of compensating workers whose income has been affected. In the discussion of old age in industry, changes in population trends, the effect of various industrial developments upon the demand for older workers, and old age pensions would be studied. The course will end with an examination of federal social security legislation.

Prerequisites: Bachelor's Degree and Principles of Economics.

THE RISE OF MODERN INDUSTRIALISM IN THE UNITED STATES. (year) Tuesdays and Thursdays, beginning September 22, at 4:50 P.M. in Room 4090 South Building. Instructor: James E. Wood.

The main purpose of this course is to trace the rise of modern industrialism in the United States and to consider the characteristics and functions of certain fundamental economic institutions in the development of our society. There will be an emphasis on the significant changes in production and distribution from the 18th century on, with the most detailed treatment falling within the last eighty years. Within this framework will be studied the development of the industrial side of our economy, from its crude colonial beginnings to its foremost position in the world economy. Some consideration will also be given to theories of history, in order not merely to review of train of significant events but to give the student a knowledge of the ways in which history can be interpreted.

The following are some of the specific subjects that will be taken up during the year.

continued - next page

THE RISE OF MODERN INDUSTRIALISM IN THE UNITED STATES - continued

First semester.-- Economic history and the economic interpretation of history; the commercial Revolution; colonial American in a system of economic nationalism; early industries; the adaptation of the machine to certain lines of production and to transportation; early modern forms of ownership; money and credit in relation to industry; sectionalism, nationalism and the beginnings of a tariff policy; the importance of the frontier; the organization of labor in a young economy; depressions in a young economy; the idea of laissez-faire and individualism; the clash of opposing cultures and its economic significance (the Civil War).

Second semester.--The 'new' Industrial Revolution; the economic significance of steel, petroleum, electricity and other basic commodities after 1865; the movement toward concentration of control and large scale enterprise; attempts to regulate big business; the racial composition of the population; population trends; recent tariff history; the recent labor movement; imperialism; standardization, large scale production and mass distribution; economic instability and the attempt of the government to stabilize; flexible and inflexible economies; economic planning.

Textbook: Shannon, Fred. A., Economic History of the People of the United States (Macmillan, 1934).

THE EVOLUTION OF ECONOMIC INSTITUTIONS (year) Tuesdays and Thursdays, beginning September 22 at 6 to 7 P.M. in Room 4092. Instructor: M.T. Wermel.

The fundamental Economic Institutions of Modern Capitalism, such as Private Property, the Price System, Machine Technique, and Business Enterprise, will be examined. The social relationships of men in the economic processes of production, exchange and distribution will be considered in the evolutionary process of their rise, development and decay. The economic institutions characterizing progressive historical stages of societal evolution will be analyzed and the mutability of these institutions will be emphasized.

The first semester will deal essentially with the economic institutions as we find them today and with recent attempts at institutional reconstruction. The second semester will attempt to trace the evolution of the economic arrangements as they are currently constituted from the epoch of Primitive Communism, through the periods of Patriarchal-Clan Social Organization, Ancient Slavery, Feudalism, Town Economies, Commercial Capitalism, the Epoch of Manufactures, Industrial Capitalism and Economic Imperialism.

PRINCIPLES OF ECONOMICS (year) Mondays and Wednesdays, beginning September 14 at 5 P.M. in Room 4090. Instructors: Dr.E.W.Braun and S.R.Smith. This course is designed to serve:

I. Students who wish a foundation for advanced economic theory.
II. Students who wish to link quantitative analysis with economic principles.

Emphasis will be placed upon the relation between economic principles and tendencies and frequency distributions, and time series including index numbers.

The first semester will be devoted to questions relating to value. Illustrative material will be drawn mainly from agricultural economics, and the second semester will be devoted to a treatment of distribution of income and other subjects such as money and banking, business cycles, and institutional economics, depending upon the available time and desires of the students.

PRINCIPLES OF ACCOUNTING (year) Tuesdays and Thursdays, beginning September 22 at 5 P.M. in Room 4649 South Building. Instructor: William H. Rowe.

First semester.--During the first semester the elementary principles and procedures of accounting will be taken up. The work will be carried on by discussion and problems. It is expected that at the end of the semester the student will be prepared to devise the accounting records necessary for a small business organization, make the necessary entries in the records, draw off statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester.--Begins January 12. The work during the second semester will deal with more advanced principles of accounting. Subject matter to be taken up will include the determination of income under special circumstances, the valuation of assets and depreciation policies, manufacturing accounts, farm accounts, partnership accounts, and corporation accounting particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

If a sufficient number of persons desire it, an additional laboratory period once a week may be provided at an additional cost of $5.00. An additional hour of credit will be granted to persons taking laboratory work.

ADVANCED STATISTICAL ANALYSIS (year) Tuesdays and Thursdays, beginning September 22 at 4:45 P.M., and a later class at 5:45 P.M. in Room 2050 South Building. Instructors: Mr. C. M. Purves and Mr. A. Sturges.

First semester.--Emphasis is placed upon methods used in the analysis of single variable problems and particularly upon the interpretation of the results derived by the use of these methods. The graduation of both frequency series and time series will be considered. The methods developed by Fisher for use with small samples will be discussed at length. Time will be devoted also to sampling methods and the importance of correct sampling procedures. The students are expected to be thoroughly familiar with the material given in a course in Elementary Statistics. R. A. Fisher's Statistical Methods for Research Workers and Leonard H. Tippet's Introduction to Statistics will be used as reference texts.

Second semester.--Begins January 12, 1937. Emphasis is placed upon methods used in analyzing problems involving several variables. The various methods of correlation are applied to practical problems to bring out the proper application of correlation in statistical analysis, the limitations of correlation analysis, and the interpretation of results. Variance analysis is also applied to problems with special emphasis on the proper application of variance and its relation to correlation analysis. The principal text books used or referred to are Ezekiel's Methods of Correlation Analysis; Snedecor's Analysis of Variance and Co-Variance; Yule's Introduction to the Theory of Statistics; Fisher's Statistical Methods for Research Workers.

ELEMENTARY STATISTICAL METHODS (year) Mondays and Wednesdays, beginning September 21 and 22 at 4:45 P.M. in Room 2050 South Building. Instructors: Mr. B. R. Stauber and Mr. F. J. Hosking.

This course consists of two halves, Elementary Statistics 1 and Elementary Statistics 2 described below, which together constitute a year's work. A course in Elementary Statistics 2, the second half, is offered in the fall semester, for students who took the first half last spring, or who have had the equivalent. Students completing Elementary Statistics 1 during the fall semester will continue Elementary Statistics 2 during the spring.

Elementary Statistics 1. (first half) Mondays and Wednesdays, beginning September 21 at 4:45 P.M. in Room 2050 South Building. This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Elementary Statistics 2. (second half) Tuesdays and Thursdays, beginning September 22 at 4:45 P.M. in Room 3816 South Building. Prerequisite, Elementary Statistics 1, or equivalent. This will be a continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to simple curvilinear correlation, the application of correlation to time series, multiple linear correlation, and an introduction to the concept of variance analysis in relation to correlation.

INTERNATIONAL TRADE (year) Tuesdays and Thursdays, beginning September 15 at 4:50 P.M. in Room 4090 South Building. Instructor: Dr. L. Volin.

The course will be devoted to the discussion of principles of international trade, the mechanism of international payments and commercial policies of the United States and selected foreign countries.

ADJUSTMENT OF OBSERVATIONS (year) Fridays, beginning September 25 at 4:45 to 6:30 P.M. in Room 2050 South Building. Prerequisite: calculus. Instructor: Dr. W. Edwards Deming.

First semester.--The course will begin with a review of the principles of summation and whatever calculus seems necessary, after which the following topics will be treated: moment coefficients, theory of Sheppard's corrections for grouping, the Gamma and Beta functions. Finite differences; interpolation by differences and by Aitken's process. Approximations to limits. The point binomial, the Type III curve and the normal curve.

Second semester.--Begins Friday, January 22, 1937. Real sampling; the ergodic hypothesis and the specification of chance. Likelihood. Tchebycheff's inequality. Confidence intervals of Newman and Pearson. The statistics of a single sample. History and pitfalls of Bayes' rule. Two or more samples. The chi-test and the analysis of variance. Curve fitting and least squares; Doolittle's and Aitken's systems of solution. The significance of parameters estimated by least squares.

Throughout the course the history of the subject and the fundamental assumptions in the application of probability theory will be kept in evidence.

MATHEMATICAL PREPARATION FOR STATISTICS (year) Fridays, beginning September 25 at 4:45 to 6:30 P.M. in Room 1447 South Building. Instructor: Harry J. Winslow. Prerequisites: High school algebra and plane geometry.

First semester.--Some time will be devoted to a review of the elementary topics of algebra. This review will be followed by topics of basic importance to the study of statistics, such as exponents, logarithms, binomial theorem, numerical approximations by means of the binomial theorem, graphs, quadratics, theory of equations, determinants, progressions, permutations and combinations, probability.

Second semester.--A brief course in trigonometry, followed by analytic geometry. The six natural and inverse trigonometric functions, identities and conditions, some work in complex numbers, De Moivre's theorem. In analytic geometry the following topics will be studied: the straight line, conic sections, other plane curves, empirical curves and curve fitting.

(This course or its equivalent will be a prerequisite for a second course, Mathematical Preparation for Statistics, II, to be offered next year and alternate years by Dr. Deming. The second course will take up the study of calculus, particularly those portions that are useful in the study and application of statistics.)

DIFFERENTIAL EQUATIONS AND APPLICATIONS (year) Mondays, beginning September 28, at 4:45 to 6:30 P.M. in Room 1447 South Building. Instructor: Harry J. Winslow. Prerequisite: Calculus.

The course will begin with a review of the differential and integral calculus necessary for the solution of differential equations. This will be followed by a study of linear differential equations of the first order and first degree, after which will come singular solutions, linear equations with constant coefficients, differential equations of order and degree higher than the first, and simultaneous equations. Emphasis will be placed on applications to problems in economics, biology, and physics, with the view of giving the student some facility in the use of differential equations.

Then for the following year, 1937-38, these two courses would be available. (The first is the same as offered in 1936-37).

MATHEMATICAL PREPARATION FOR STATISTICS, I (year)

First semester, algebra.
Second semester, trigonometry and analytic geometry.
(Mr. Winslow)

MATHEMATICAL PREPARATION FOR STATISTICS, II (year)

First semester, differential calculus
Second semester, integral calculus.
(Dr. Deming)

AN INTRODUCTION TO ORGANIC CHEMISTRY (year) Mondays and Thursdays, beginning September 14 at 4:50 P.M. in Room 1128 South Building. Second semester begins January 11, 1937. Instructor: Dr. E. P. Clark.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatmentof compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

FOOD SELECTION FOR GOOD NUTRITION (one semester) Tuesdays and Thursdays, beginning September 15 at 4:40 P.M. in Room 6423 South Building. Instructors: Dr. H. E. Munsell and Dr. H. K. Stiebeling.

This course will consist of selected readings, discussions, class exercises and demonstrations to give the non-specialist a working knowledge of the fundamental principles of nutrition. It will include a study of the nutritive values of different types of foods, and the selection of food combinations to yield adequate and satisfying meals. Especial stress will be paid in the selection of adequate diets at different levels of cost, and on the effect of food preparation on the digestibility and nutritive value of food. The following prerequisites are desirable, but not necessary except for those who wish graduate credit; a general course in physiology, inorganic and organic chemistry, and physics.

SOILS: "Their Morphology, Genesis and Classification." (one semester) Mondays, Wednesdays and Fridays, beginning December 14 at 4:45 P.M. in Room 4003 South Building. Instructor: Dr. Charles E. Kellogg, Chief, Division Soil Survey. Fee - $15.00 (3 semester credits).

The course will outline theprinciples of soil development with examples from the United States. Students should have had the equivalent of college freshman chemistry; previous training in plant physiology, geology, geography, and logic would be helpful, but not essential. The particular material drawn from these fields would be developed in the lecture and/or in assigned readings.

In the development of the course the subject matter will be treated in the following order:

(1) Brief history of the development of soil science, especially in its relationship to agriculture.

(2) The nature of soils. A summarized discussion of the principal properties of the soil mass such as color, texture, structure, colloids, and similar fundamental characteristics. This material will be treated briefly and only those important phases will be discussed which bear directly upon the remainder of the course.

(continued next page)

SOILS: "Their Morphology, Genesis and Classification." continued:

(3) The factors of soil genesis.
(a) Parent rocks and weathering.
(b) Influence of living matter.
(c) Influence of climate.
(d) Influence of relief.
(4) Determination of soil morphology and the classification of types (briefly).
(5) The processes of soil development. This section will include about half or more of the course, and the great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed. These are: Calcification, podzolization, laterization, salinization, solodization, solonization, gleization.
(6) Systems of soil classification.
(7) A few lectures at the class summarizing the whole and discussing the implications and relationships to agriculture as a whole.

A second semester of this course will be followed with seminars on land classification; depending upon the wishes of the class one or two lectures at the close will be devoted to land classification.

GLASS BLOWING (year) Mondays and Wednesday, beginning September 14, at 4:50 P.M. in Basement of Smithsonian Institution. Instructor: Dr. Leland B. Clark. Fee: including materials $18.00 a semester.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" were utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work. Registration is limited to ten students.

Second semester begins, Monday, January 11.

MICROSCOPIC TECHNIQUE AND HISTOLOGY (year) Wednesdays from 7 to 10 P.M., beginning September 16 in Room 223-East Wing, Adm. Bldg. Instructor: Dr. Chas. Wm. Rees.

This course will take up the methods of preparation and study of animal cells, tissues and organs. This study of the normal body is a preparation for a course on the pathology of protozoan and virus diseases.

The second semester will deal with the pathology of protozoan and virus diseases.

The purpose of the course is to point out selected methods of procedure for the investigation of diseases whether this is the student's principal objective or whether it arises as a complicating factor of problems having other objectives. The subjects to be studied are: (1) effects of the parasites on the hosts, (2) effects of the host on the parasites, and (3) effects of in vitro environment on micro-organisms.

The course will comprise a study of (1) the nature of the cellular

MICROSCOPIC TECHNIQUE AND HISTOLOGY - continued:

response, and (2) the nature of the humoral to invasion by microorganisms and viruses, and will include cytological and life histology studies of the common protozoan parasites.

PLANT ECOLOGY (year) Mondays, Wednesdays and Fridays, beginning September 14 at 4:40 P.M. in Room 4609. Instructor: Dr. M. B. Waite.

PLANT DISEASES WITH SPECIAL REFERENCE TO CAUSE AND CONTROL. (year) Mondays, Wednesdays and Fridays, beginning September 14, at 4:40 P.M. in Room 4609. Instructor: Dr. M. B. Waite.

SYSTEMATIC BOTANY (year) Mondays and Wednesdays, beginning October 5, at 4:50 P.M. in Room 110-West Wing, Adm. Bldg. Instructor: Dr. S.F. Blake.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles and classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower are studied. The principles of botanical nomenclature are discussed and some of the more important floras and monographs examined. The second semester beginning January 18 will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

EXTENSION SEMINARS (year) Instructor: M. C. Wilson. Twice per week, hour arranged to meet the convenience of class. Room 5534 South Building. Open to those with extension teaching experience, or with background of educational training satisfactory to instructor. No tuition fee.

First semester.--Extension Methods.--Ways of measuring extension progress; the influence of such factors as size of farms, land tenure, educational training, age, and contact with extension workers upon effectiveness of extension teaching.

The various means and agencies employed in extension teaching as: result demonstrations, method demonstrations, meetings, news articles, personal service, bulletins, exhibits, circular letters, extension schools, and radio, will be carefully analyzed from the standpoint of their teaching function; adaptability to different subject matter, relative influence, relative cost, and interrelationship.

Second semester.--Extension Administration and Supervision.--

Principles of efficient extension administration; analyses of supervisory functions and procedures; duties of State and district supervisors of county agricultural agents and home demonstration agents; relations of State specialists and county workers. Practical study of the problems arising in the administration and supervision of extension at the college and in the field.

EXTENSION THESES. --M.C. Wilson. Room 5534 South Building. Qualified students interested in undertaking a research problem in extension education may receive credit for special problem work provided an acceptable plan is presented and the completed thesis meeting approval of a thesis committee. No tuition fee.

ENGLISH GRAMMAR AND COMPOSITION (year) Mondays and Wednesdays, beginning September 21 at 4:50 P.M. in Room 4092 South Building. Instructor: Dr. Homer C. House (Head of the Department of the English Language and Literature, University of Maryland.

This course provides in the first semester a thorough review of the fundamentals of grammar and sentence structure and a careful study of English usage. Some attention is given also, to the history of form and sentence structure. Students are required to analyze sentences by diagram and to correct examples of bad English. After the completion of grammatical study the second semester goes on to develop more general phases of the art of writing: accurate statement, vocabulary, exposition, description, and (if time is available) narration and verse.

ENGLISH GRAMMAR AND COMPOSITION (SECOND SEMESTER ONLY) Tuesday and Thursday at 4:50 P.M. in Room 4092 South Building. Instructor: Dr. Homer C. House. Beginning September 22.

THE SECOND SEMESTER IS A CONTINUATION OF THE CLASS ORGANIZED JANUARY 14, 1936.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (one semester) Mondays, Wednesdays and Fridays, beginning September 14 at 4:50 P.M. in Room 505 Administration Building. Instructor: Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Divisions of Publications, Office of Information.

This course is intended primarily for those who are concerned with the detailed editing or preparation of manuscripts for the printer after they leave the author's hands. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration of the subsidiary features, such as titles, tables of contents, headings, footnotes, illustrations, literature citations, and bibliographies; the principles of table formation and arrangement; the preparation of appropriate table heads, boxheads, and stubs; marking for type and the relation of type to the subject treated; and the fundamentals of indexing and proof reading. Practical work in editing manuscripts, involving familiarity with the Style Manual of the Government Printing Office, will be required of all members of the class, and the editorial work will be carefully scrutinized and criticised.

ELEMENTARY SCIENTIFIC FRENCH (year) Mondays and Wednesdays, beginning September 21 at 8 to 9 A.M., in Room 5610 South Building. Instructor: Dr. Harry B. Humphrey.

Instruction in elements of French grammar. Reading and translation of elementary articles from selected scientific texts. This course is designed to prepare beginners for the advanced course in Scientific French.

ADVANCED SCIENTIFIC FRENCH (year) Mondays and Wednesdays, beginning September 21 at 4:45 P.M. in Room 5610 South Building. Instructor: Dr. Harry B. Humphrey.

ELEMENTARY GERMAN (year) Mondays, beginning September 14 from 5 to 7 P.M. in Room 223 East Wing, Adm. Bldg. Instructor: Dr. C. H. Leineweber. Second semester will begin January 11.

SCIENTIFIC GERMAN (year) Fridays, beginning September 18 from 5 to 7 P.M. in Room 223 East Wing, Adm. Bldg. Instructor: Dr. C. H. Leineweber. Second semester will begin January 15.

ADVANCED GERMAN (year) Tuesdays, beginning September 15 from 5 to 7 P.M. in Room 223 East Wing, Adm. Bldg. Instructor: Dr. C. H. Leineweber. Second semester will begin January 12. This course is a continuation of first year German.

ELEMENTARY RUSSIAN (year) Wednesdays, beginning September 16 from 5 to 7 P.M. in Room 223 East Wing, Adm. Bldg. Instructor: Dr. C.H. Leineweber. Second semester will begin January 13.

This course is especially designed to enable to student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Methods.

ADVANCED RUSSIAN (year) Thursdays, beginning September 17 from 5 to 7 P.M. in Room 223 East Wing, Adm. Bldg. Instructor: Dr. C. H. Leineweber, Second semester will begin January 13.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite, two semesters of Russian grammar and reading.

SCIENTIFIC AND TECHNICAL SPANISH (year) A non-credit course. Tuesdays and Thursdays, beginning September 15, Room 4616 South Building at 4:50 P.M. Instructor: Henry Bartman.

Course designed primarily for advanced students in Spanish who desire greater facility in reading or translating technical and scientific Spanish.

ELEMENTARY SPANISH (year) Mondays, beginning September 14 from 5 to 7 P.M. in Room 4616 South Building. Instructor: Miss Roberta M. Olds (Chairman, Dept. Spanish, American U.)

This course aims to secure accuracy and facility in the use of the language by means of drill in pronunciation, grammar, translations, and reading. Reading of less difficult modern prose with practice in composition, diction and conversation.

(A text containing the fundamentals of Spanish grammar will be completed. A reader with selections appropriate to Spain and Spanish-American countries will be used.)

ADVANCED SPANISH (year) Wednesdays, beginning September 16 from 5 to 7 P.M. in Room 4616 South Building. Instructor: Miss Roberta M. Olds.

A brief review of grammar with continued study of pronunciation and practice in oral and written composition. A study of Spain and Spanish-America through use of maps, Spanish papers, and appropriate texts. Reading of short selected works of modern authors. Dictation and conversation.

(A brief text combining grammar review and composition will be used. Suitable readings selected.)

ELEMENTARY ITALIAN (year) Saturdays, beginning September 12 from 1 to 3 P.M. in Room 4649 South Building. Instructor: Dr. Nicholas G. Barbella.

ADVANCED ITALIAN (year) Saturdays, beginning September 12 from 3 to 5 P.M. in Room 4649 South Building. Instructor: Dr. Nicholas G. Barbella.

TECHNICAL SHORTHAND SPEED WRITING (one semester) Tuesdays and Thursdays, beginning September 15 at 4:45 P.M. in Room 4613 South Building. Instructor: Clara E. Richter.

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed; in addition, supplementary relevant material will be used. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand which they write prior to entering the class. A non-technical entrance examination will be held Tuesday, September 15, at the rate of 100 words per minute. It is required that each student have an admission card to the examination room which can be obtained from the Graduate School, Room 4090 South Building. All admission cards must be secured prior to date of examination.

Dr. A. F. Woods
Director, Graduate School
Room 4090 South Building
U. S. D. A.

I wish to register for the following courses:

_____

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(Educational work completed giving schools and degrees:)

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Those who cannot pay full fee in advance must register at office. Upon receipt of fee, registration cards will be mailed.

Present position - Civil Service Status:

_____

Official Address _____ Telephone _____
(Where employed) _____.

I will call at your office and complete registration _____.

Name _____

Home Address _____ Telephone _____

I enclose check or money order for: _____

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COURSES STILL OPEN FOR REGISTRATION

There is still opportunity to register in the following courses in the GRADUATE SCHOOL OF THE DEPARTMENT OF AGRICULTURE:

PRINCIPLES OF ACCOUNTING - FIRST AND SECOND YEAR COURSES, beginning Oct. 3rd

STATISTICS COURSES - ELEMENTARY AND ADVANCED, beginning Oct. 3rd

BASIC PHOTOGRAPHY - A COURSE FOR BEGINNERS, beginning Oct. 3rd

PUBLIC SPEAKING - PRACTICAL AND ADVANCED COURSES, beginning Oct. 4th

ENGLISH - COURSES IN GRAMMAR, GOVERNMENT CORRESPONDENCE, EDITING AND LITERATURE, beginning Oct. 3rd and 4th

ECONOMICS - ELEMENTARY AND ADVANCED COURSES, beginning Oct. 3rd

LANGUAGES - ELEMENTARY AND ADVANCED COURSES IN FRENCH, GERMAN, ITALIAN, RUSSIAN, SPANISH, as well as CONVERSATIONAL SEMINARS, beginning Oct. 3rd and 4th

GRAPHIC PRESENTATION - ECONOMIC DATA, ARCHITECTURAL, MECHANICAL and FREEHAND DRAWING, SKETCHING and BLUEPRINT READING, beginning Oct. 15th

PSYCHOLOGY, SOCIOLOGY, PHILOSOPHY, LAW, beginning Oct. 3rd and 4th

MATHEMATICS, ELEMENTARY AND ADVANCED COURSES, including ALGEBRA, GEOMETRY, TRIGONOMETRY, CALCULUS, etc., beginning Oct. 3rd and 4th

CHEMISTRY - ELEMENTARY AND ADVANCED COURSES, beginning Oct. 3rd

STENOGRAPHY - 50 to 100 WORDS; 100 to 150 WORDS; 130 to 170 WORDS; and 190 WORDS A MINUTE, beginning Oct. 3rd and 15th

The Congress of the United States has made special provision for making the facilities for study and research in the government departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe (Joint Res. April 12, 1892-27 Stat. 395; Deficiency Act of March 3, 1901-31 Stat. 1010, 1039).

The formal outline of courses is organized on a college basis, and a certificate showing the work accomplished is issued to each student upon request. These certificates are accepted by the Civil Service Commission, and by graduate schools and accredited colleges wherever the work fits into the program of studies approved by such schools.

Those desiring training in these fields should communicate promptly with the Graduate School, Department of Agriculture, Room 4080 South Building.

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U. S. DEPARTMENT OF AGRICULTURE

EXTENSION SEMINAR - ORGANIZATION AND CONDUCT OF 4-H CLUB WORK (V) - Barnard Joy; Mon. from 7:30 to 9:30 p.m., commencing Oct. 10th, in room 5554, South Building. (2 cr.) Fee - $12.00. Register in room 4090 South Building, office of the Graduate School, Department of Agriculture.

The course includes the development of 4-H club programs and organization considering: objectives, psychological groupings, community integration, program content, community, county, State, and Federal organization, selection and use of local leaders, annual plans of work, and evaluation. It takes into consideration the methods employed in 4-H work including: projects, club meetings, demonstrations, judging work, exhibits, achievement days, camps, short courses, and leader training.

Prerequisite: Experience as an extension worker or background of educational training satisfactory to the instructor.

AN INTRODUCTION TO THE ART OF THINKING (I) - Miss Cecile Willink; Fri. from 7 until 9 p.m., commencing Oct. 7th. Room 4092 South Building. Fee $12.00 per semester.

This course is intended for those who would vitalize their mental life; who would have greater opportunity for self-realization. (Among the thousands of "gainful occupations" listed by the Census Bureau, not one in a hundred offers any outlet for the higher abilities. Thus, for most of us the work we do is but a small phase of our life, affording little opportunity for living, and we ourselves must develop ways of expression.) One method is a pleasant form of mental discipline.

This course consists of a study of words, in their ordinary and symbolic use; the making of abstracts of sentences, paragraphs, and longer selections; the study of poems, beginning with simple masterpieces, by precis-writing and appreciation; finally, the memorizing and vocal interpretation of the poems. Further appreciation will proceed in the approach to another art -- the study and enjoyment of a few masterpieces of painting.

Since the course consists of two phases -- Impression and Expression -- the students will be called upon from time to time to give talks on the subjects studied.

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A course in AERIAL PHOTOGRAPHY is in the process of organization. It will include the types of work, in this field, of interest to workers in Soil Conservation, Soil Survey, and other agencies charged with similar programs. The course will be in charge of an expert.

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Note: On account of the rainy weather, the penalty for late registration has been lifted for the rest of this week (i.e. until October 1st).

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The Graduate School wishes to direct attention to the course

SPECIAL TOPICS IN STATISTICS

Fridays at 4:45; 1 hour

Fee $6 per semester

First lecture Oct. 7th.

No outside study required. The first four lectures are as follows:

October 7th and 14th, Mr. Frederick F. Stephan, "Some principles of sampling for population surveys," and "Pitfalls for statistical investigators."

October 21st and 28th, Mr. Sidney W. Wilcox, "Adjustment of indexes of employment and payrolls to census data," and "The problem of over-exposure in sampling."

For other lectures, see page 23 of the Graduate School bulletin.

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Other courses in
MATHEMATICS and STATISTICS

-- Offered this semester --

College Algebra. Mr. Winslow, Tues. and Thurs. at 4:45 beginning Sept. 27. Room 4637.

Calculus of Finite Differences. Dr. Deming, Mon. and Wed. at 4:45 beginning Oct. 3d. Room 1031.

Mathematics of Investment. Mr. Rasor and Mr. Bronson, F.A.S., Tues. and Thurs. at 4:45 beginning Oct. 4th. Room 1031.

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U. S. DEPARTMENT OF AGRICULTURE

Advanced Calculus. Mr. Wertheimer, Wed. and Fri. at 4:45 beginning Sept. 30th. Room 1439.

Introduction to Statistical Analysis. Messrs. Stauber, Ockey, and Kullbach, Mon. and Wed., also Tues. and Thurs., at 4:45 beginning Sept. 20th and 21st. Room 1039.

Statistics Laboratory. Dr. Beatrice Aitchison, Thursdays at 7 p.m. beginning Sept. 29th. Room 4090.

Interpretation of Statistical Calculations. Mr. Alexander Sturges, Mon. and Wed. at 4:45 beginning Sept. 21st. Room 3034.

Statistical Treatment of Experiments. Dr. Brandt, to commence about Nov. 15th; end March 15th.

Multivariate Analysis. Mr. Girshick, Tues. and Thurs. at 4:45 beginning Sept. 27th. Room 1027.

Analytic Curve Fitting. Mr. Sasuly, Mon. and Wed. at 5 beginning Sept. 28th. Room 1027.

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A course in preparatory algebra is being organized for students not ready to go into College Algebra. Register now; course begins October 15th.

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Some others available in the 2d semester only; see the bulletin for details.

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LECTURES ON ADMINISTRATION

M. L. Wilson, Under Secretary
Chairman

February 2 THE ADMINISTRATIVE PROCESS
Louis Brownlow - Chairman, President's Committee on Administrative Management, and Director, Public Administration Clearing House.

February 9 THE ADMINISTRATIVE PROCESS IN RELATION TO THE POLICY MAKING PROCESS
Arthur W. MacMahon - Professor of Public Law, Columbia University.

February 16 THE ADMINISTRATIVE PROCESS IN RELATION TO THE JUDICIAL PROCESS
John Dickinson - Professor of Law, University of Pennsylvania, formerly Assistant Secretary of Commerce, and Assistant Attorney General in charge of anti-trust law enforcement.

February 23 SHOULD ADMINISTRATORS BE GENERALISTS OR SPECIALISTS?
John M. Gaus - Professor of Political Science, University of Wisconsin, National Resources Committee Consultant, and Research Consultant, Social Science Research Council.

Auditorium, South Building, Department of Agriculture

4:30 to 5:30 p.m. Fee $1.00 for series. Register in person or mail check or money order. A limited number of seats available to those interested outside the Department of Agriculture.

Register in room 4090 South Building.

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THE GRADUATE SCHOOL
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Six more lectures on -

SCIENCE: Its History, Philosophy, and Relation to Democracy
M. L. Wilson, Under Secretary of Agriculture, in charge
5 o'clock in the Auditorium

This series is being attended by about 450 people, but there is still room for more. Tickets for the remaining six lectures may be obtained for $1.50, either at the door or from the office of the Graduate School. Mail orders for tickets are given prompt attention, and personal cheques are accepted.

April 4th (Tuesday)	The history of science and its place in contemporary civilization. - Henry E. Sigerist (Professor of the History of Medicine, Johns Hopkins)
April 12th (Wednesday)	What are scientific ideas? - Charles W. Morris (Professor of Philosophy, Chicago)
April 19th (Wednesday)	The place of science in democracy.
April 26th (Wednesday)	Society and organism. - Walter B. Cannon (President of the A.A.A.S.; Professor of Physiology, Harvard)
May 3d (Wednesday)	To what extent is a science of man possible? - Frederick Osborn (Museum of Natural History, New York)
May 9th or 10th	How can science get support in a democracy?

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METEROLOGY AND CLIMATOLOGY (III, IV) - Wednesdays and Fridays at 5 commencing November 2d at the Weather Bureau, 24th and M Sts., N. W., in the assembly room, 7 first floor. Dr. Horace G. Byers will be in charge, assisted by Messrs. H. Wexler, C. H. Pierce, and other experts of the Weather Bureau. A portion of the course will be given by Commander W. M. Lockhart of the Navy Dept. Dr. C. W. Thornthwaite of the Soil Conservation Service will assist in the second semester. Fee $12.00 a semester. (4 cr.)

The first semester will be devoted to a general, largely non-mathematical treatment of atmospheric processes with special emphasis on air mass analysis methods and their application to synoptic charts of the surface and upper-air and to forecasting. While the course is intended to be of an introductory nature, those without some familiarity with meteorology will be at a disadvantage.

In the second semester a course in climatology, based on the newer concepts of physical meteorology, will be developed. Problems of agriculture, hydrology, soil conservation, land forms, and human settlement as related to climatic or meteorologic conditions will be discussed.

AGRICULTURAL CREDIT IN THE UNITED STATES (IV, V) - Fridays from 5 to 7:30 commencing November 11th. Instructor: Fred L. Garlock. Fee $18.00. (3 cr.)

This course is concerned with the financial requirements of agriculture and with the methods by which the industry is financed. In part historical, the course will describe the evolution of the financial mechanism for supplying farm credit, will explain historical changes in the use of credit in agriculture, and will trace the movement of the farm debt. Principal attention, however, will be devoted to the present financial conditions and requirements of farmers and the modern mechanism for supplying them with credit. The underlying principles upon which agricultural financing is now conducted will be analyzed.

Essentially the same course was given for several years at the Brookings Institution, under a grant from the Social Science Research Council, by the present instructor.

Register in room 4090 South Building

The lectures on ADMINISTRATIVE MANAGEMENT delivered from October to December, 1937, are now available in printed form at the Graduate School, room 4090 South Building.

In view of the many requests for copies of the lectures on ELEMENTS OF PERSONNEL ADMINISTRATION; PRINCIPLES AND TECHNIQUES, a new edition of this publication has been ordered and will be available within a few days.

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THE GRADUATE SCHOOL
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announces a lecture by

Sir John Boyd Orr, M.D., D.Sc., LL.D., F.R.S.,
Director of the Rowett Research Institute, Aberdeen;
Director of the Imperial Bureau of Animal Nutrition

who will deliver an address on

"The Nutritional Problems of the British Empire"

Friday April 21st
at
4:45 p.m.

in the Auditorium
of the
Natural History Building
of the
National Museum
10th St. and Constitution Ave.
Washington

Nutrition in its relation to health and national policy is a live subject in the British Empire. Sir John, as the result of his investigations of the nutrition of men and animals and of the nutritional status of people, and for his membership on the Committee on Nutrition (Ministry of Health) and the Colonial Advisory Council on Agriculture and Animal Health, has an unusual background for the discussion of the scientific and economic problems of the nutrition of men and animals.

The Canadian Medical Association's Committee on Nutrition is bringing Sir John to Canada to give a series of lectures in various cities on food and health and national food policies.

This is an open lecture. Anyone who is interested is invited to attend.

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1939

SUMMER COURSES

In view of the increasing demand for work during the summer, the Graduate School, U. S. Department of Agriculture, is arranging to offer certain courses where requests for them are received sufficiently early to make the necessary arrangements.

The courses so far requested are:

ADVANCED FRENCH. 1st and 2nd semesters (6 hours credit). Beginning date, May 21. Instructor: Dr. H. B. Humphrey.

FUNDAMENTALS OF ECONOMIC THEORY -- VALUE, PRICE AND DISTRIBUTION. One semester, Tuesdays and Thursdays, 5-7 P.M.; June 21 - August 18. (2 hours credit) Instructor: Dr. Max J. Wasserman. Register room 4090 South Building. Fee: $12.00.

This course is designed to give graduate students of economics a solid foundation in those fundamental elements of economic theory which are essential to economic and statistical analyses. The course will first take up the theories underlying the determination of value in use, value in exchange, price, wages, rent, interest, and profits of the leading

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economists of the Classical, Psychological or Austrian, schools. It will then proceed to an analysis of Alfred Marshall's reconciliation of the theoretical positions of these two schools. The course will next take up a critical examination of these theories in the light of recent economic developments. It will be developed that these theories of value and distribution were elaborated to fit economic environment of an earlier type; that is, a laissez-faire economy, and that they are now in need of considerable revision if they are to be adapted to modern economic life. The final part of the course will undertake to develop original theories of value, price and distribution, adapted to the present type of economy.

ENGLISH LITERATURE SINCE 1800. One semester, Tuesdays and Thursdays, 4:30-6:30 P.M.; June 14 - August 18. (3 hours credit) Instructor: Albert S. Kerr. Register room 4090 South Building. Fee: $22.50.

A rapid survey of the main currents in English literature since the Romantic Movement, both poetry and prose, with emphasis on economic, sociological, and philosophical tendencies and their effects on present times. Beginning with Wordsworth, the course will treat the outstanding writers of the Nineteenth Century, to be followed by study of Twentieth-Century developments. Readings, lectures, discussions, and careful analyses of a few important works with some supplemental reading in the novel and the drama.

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UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

Preliminary List of Courses 1938-1939

The General Bulletin of Information will be ready July 15th, and will include the following courses. The designations I to V indicate year levels; numbers following in parenthesis refer to cooperative course numbers in American University. Other courses than those indicated may be made cooperative if request is made in advance at time of registration. The number of credits to be granted is indicated in brackets [ ].

Additional courses are being considered. Those desiring courses not listed in this program should consult the Director of the Graduate School.

Graduate credit can be obtained only by those who have a bachelor's degree from a standard college or university. Undergraduate credit requires graduation from a standard high school or equivalent.

For a copy of the general bulletin, or for further information, write to Eva M. Johnson, Secretary, or to A. F. Woods, Director, 4090 South Building.

Accounting

Principles of Accounting. Year (Rowe, Jarvis, Nielsen; III B.A.331-332) [6].
Accounting, second year. Year (Nielsen; III B.A.334) [6].
Income Tax Procedure. One sem. (; IV B.A.) [3].
Cost Accounting. One sem. (; IV-V) [3].
Interrelations between Economic Theory and Accounting. Year (Massel; IV-V) [4].
Mathematics of Finance. One sem. (Rowe; IV B.A.401) This year and alternate years. [2]. (See also Mathematics of Investment under Mathematics)

Bacteriology. Year (Rees; IV-V) [4].

Botany

Systematic (flowering plants). Year (Blake; II-III). [4].
Plant Ecology. Year (Waite; IV-V) [6].
History of Botanic Research. Year (Cook; IV-V) [6].
Plant Breeding with Reference to Disease Resistance. One sem. (Stevenson; V) [3].

Chemistry

Organic, introduction. Year (Clarke; III) [4].
Organic, advanced. Year (Rose; IV-V) [4].
Inorganic, advanced. Year (Hoffman; IV-V) [4] (Not given 1938-39; avaliable again in 1940).
Physiological. Year (Calvery; IV-V) [4].

Cotton Classing. Classes by special arrangement. (III-IV) [2] (Limited to those having expert knowledge of cotton)

Economics

Social and Economic History of American Agriculture. Year (Edwards; IV-V) [6].
History of Economic Thought. Year (Wasserman; IV-V) [4].
Contemporary Economic Problems. Year (Wasserman; IV-V) [4].
Money and Banking. Year (Wasserman; IV-V) [4].
Principles of Economics. Year (Braun; III) [6].
Foreign Trade Problems in Relation to Agriculture. Year (Wheeler; IV-V) [4].
Economics of Instability. One sem. (Ezekiel and Bean; V) [3].
Farm Management. Year (; IV-V) [6].

English

Descriptive English Grammar. One sem. (Harman; IV-V) [3].
Applied English Grammar. One sem. (Harman; IV-V) [2].
Modern Poets, first sem. American, second sem. English. Year (House; IV-V) [6].
Rural Novel. One sem. (Sherman; IV-V) (seminar)
English Novel. Year (Kerr; IV-V) [4].
English Literature Since 1800. Year (Kerr; IV-V) [6].
Seminar in Creative Writing. Year (Barron; II) [4].
Government Correspondence. Year (Sanders; I) [4].
Practical Public Speaking. One sem. (King; I) [2].
Editing Manuscripts on Agriculture, Home Making and Related Subjects. One sem. (Merrill; IV-V) [3].
Library Survey. Year (Barnes; II) [4].

Glass Blowing. Year (Clark; IV-V) [4]. Class limited to 10.

Graphic Presentation

Principles and Practice of Graphic Presentation of Economic Data. Year (Hainsworth; IV-V) [3].
Freehand Drawing, Elementary. Year (Magnuson; II) [8]. (4 hours a week and 4 hours assigned work).
Architectural Drawing. Year (Magnuson; I-II) [8]. (4 hours a week and 4 hours assigned work).
Mechanical Drawing. Year (Garlock; I) [8]. (4 hours a week and 4 hours assigned work).
Sketching. Year (Magnuson; I) [4].

Photography. One sem. (Hanson; III-IV) [2].

Labor Law. One sem. (Ziskind; IV-V) [3].

Labor Problems. Year (Ziskind; IV-V) [6].

Social Legislation Seminar. One sem. (Leet; IV-V) [3].

Languages

French Conversation Seminar. Year (Sabarth; III) [6].
German Conversation Seminar. Year (Sabarth; III) [6].

Languages (continued)

Economics in French and German. Year (Bauer; V) [4].
Elementary French. Year (Humphrey; I-II) [6].
Scientific French. Year (Humphrey; III-IV) [6].
Elementary German. Year (Leineweber; I-II 102) [6].
Scientific German. Year (Leineweber; III-IV) [6].
Advanced German. Year (Leineweber; IV-V, Goethes Faust) [6].
Elementary Russian. Year (Leineweber; I-II) [6].
Advanced Russian. Year (Leineweber; III-IV) [6].
Elementary Spanish. Year (Olds; I-II) [6].
Intermediate Spanish. Year (Olds; II) [6].
Advanced Spanish. Year (Olds; III-IV) [6].
Elementary Italian. Year (Barbella; I-II) [6].
Advanced Italian. Year (Barbella; III-IV) [6].

Mathematics. (See also courses in statistics)

Algebra. 1st sem. (Winslow; II Stat.262) [2].
Algebra, Linear. Year (Girshick; V) 1940-41 and every third year. [4].
Higher Algebra. 1st sem. (Finan; IV-V) This year and every third year. [3].
Trigonometry and Geometry. 2d sem. (Winslow; II Stat.262) [2].
Calculus. Year (Deming; III) 1939-40 and alternate years. [6].
Calculus of Finite Differences. 1st sem. (Deming; IV-V) This year and every third year. [2].
Calculus, advanced. Year (Wertheimer; IV-V) This year and alternate years. [4].
Theory of Infinite Processes. Year (Winston; V) 1939-40 and every third year. [4-6].
Mathematics of Investment, advanced. 1st sem. (; IV-V) This year and alternate years. [2-3]. (See also Mathematics of Finance under Accounting).
Theory of Functions. Year (Girshick; V) 1939-40 and alternate years. [4-6].

Mineralogy. Year (Glass; IV-V) [4-6] Class limited to 25.

Radio Engineering. Year (Cohen; IV-V) [4].

Morphology, genesis, and classification of soils. 1st sem. (Kellogg; V) [3].

Soil Conservation. Year (; V) [6].

Statistics (See also courses in mathematics)

Introduction to Statistical Analysis. Year (Stauber and Ockey; III, 361-362) [6].
Statistical Laboratory. Year (Aitchison; III, 361-362)
Interpretation of Statistical Calculations. Year (Sturges; IV-V, 552-553) [4].
Index Numbers and Time Series. Year (Purves; IV-V) [4].
Statistics for Biological Workers. (; IV-V) 1939-40 [4].
Statistical Treatment of Experiments in the Plant and Animal Industries. Nov.-Apr. (Brandt; IV-V) [3].

Statistics (continued)

Adjustment of Observations. Year (Deming; IV-V) 1939-40 and every third year. [6].

Least Squares. 2d sem. (Deming; IV-V) This year and every third year.

Multivariate Analysis. Year (Girshick; V) This year and every third year. [4]

Analytic Curve Fitting. 1st sem. (Sasuly; V) This year and every third year. [2].

Dynamic Analysis of Time Series. 2d sem. (Sasuly; V) This year and every third year. [2].

Special Topics in Statistics (lectures). (IV-V) [1].

Statistics Seminars (general).

Statistics Seminars (advanced).

Stenography Speed Development. Starting at 100 words per minute. (Richter and Neter) English, German, French, Dutch, Spanish and Italian.

Rural Sociology. One sem. (Taylor and Loomis; V) [2].

History of Social Thought and Theory. One sem. (Taylor and Loomis; V) [2].

Social Psychology. Year (Kaufman; IV-V) [4-6].

General Psychology. Year (Kaufman; IV-V) [6].

General Sociology. Year (Kaufman; IV-V) [6].

History of Philosophy. Year (Painter; IV-V) [6]

Survey of Public Personnel Management. coop. A.U.

Management and Supervision. coop. A.U.

Supreme Court, Current Decisions. Year (Hankin; IV-V) [4]. Seminar.

Patent Law and Procedure. One sem. (Boone; IV-V) [2].

Special Lectures. Programs arranged through the year presenting leading experts.

Extension Seminars. Year (Wilson and Joy; IV-V) [6].

1. Organization programs and projects.
2. Extension methods. Year

Filing Seminar. Year (Lucas)

General Lectures

Social Problems of Today. Fri. 5-6, Sept.-Jan (Dr. Kaufman, chairman).

Human Relations in the Light of Psychology. Fri. 5-6, Jan.-April. (Dr. Kaufman, chairman).

Other lectures to be announced later.

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PUBLICATIONS

Publications available at the Graduate School

Some Notes on Least Squares, by W. Edwards Deming; price $1.50

Lectures and Conferences on Mathematical Statistics, by J. Neyman, edited by Deming; price $1.25

On The Statistical Theory of Errors, by W. Edwards Deming and Raymond T. Birge; price 35¢

Lectures on Statistics by Dr. Walter A. Shewhart of the Bell Telephone Laboratories; price 75¢

Lectures on Current Economic Problems, by various outstanding speakers in that field; price 50¢

Lectures on Discovering Ourselves: Psychology Today, by various outstanding speakers in that field; price 50¢

Lectures on Administrative Management, by various outstanding speakers in that field; price 50¢

Elements of Personnel Administration; Principles and Techniques, by various outstanding speakers in that field; price 35¢

(Postage extra)

AUG 1 1938 ☆
Department of Agriculture

THE DEPARTMENT OF AGRICULTURE
THE GRADUATE SCHOOL
WASHINGTON

We are pleased to send you the publications checked below:

	Price	Postage U.S.	Postage Foreign
ON LEAST SQUARES by W. Edwards Deming	$1.50	*17¢	15¢
LECTURES AND CONFERENCES ON MATHEMATICAL STATISTICS by J. Neyman, edited by W. Edwards Deming	$1.25	*17¢	13½¢
ON THE STATISTICAL THEORY OF ERRORS by W. Edwards Deming and Raymond T. Birge	35¢	4½¢	4½¢
LECTURES ON STATISTICAL METHODS by Walter A. Shewhart	$1.50	*10¢	12¢
ADMINISTRATIVE MANAGEMENT by outstanding leaders in that field	50¢	*10¢	7½¢
CURRENT ECONOMIC PROBLEMS by outstanding leaders in that field	50¢	*17¢	22½¢
ELEMENTS OF PERSONNEL ADMINISTRATION by outstanding leaders in that field	35¢	6¢	6¢
UNDERSTANDING OURSELVES: A SURVEY OF PSYCHOLOGY TODAY by outstanding leaders in that field	50¢		

Your cheque / money order for $_____ has been received with thanks, a small balance of ____¢ still being due (U. S. and British stamps accepted).

* This book takes domestic parcel post rates; for convenience the postage quoted represents an average charge, which in specific instances may be more or less than that actually required.

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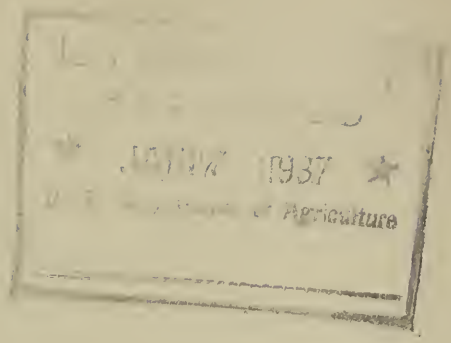
GRADUATE SCHOOL

U. S. DEPARTMENT OF AGRICULTURE



MEETINGS OF THE FILING SEMINAR GROUP
Chairman - Mrs. Maude S. Ponton.

1937

January 5 - Secretary's File Room - 104 Administration Building
Mr. Donaldson, Leader.

* January 12 - Department of Justice Finger Print Files.

January 19 - Solicitor's File Room - Pent House, Administration Building
Mr. McDermott, and Mr. Jones.

February 2 - Bureau of Entomology and Plant Quarantine General Files
Room 6847 South Building - Miss Miller, Leader.

February 9 - A.A.A. Central Files - Room 6722 South Building
Mrs. Cowles, Leader.

February 16 - Photographic Filing - Room 5540 South Building
Mr. Carl Hanson, Extension Service, will discuss systems of filing various set-ups, including photography and other subjects.

February 23 - Chemistry and Soils Files - Room 4110 South Building.
Miss B. E. Farley, Leader.

* Final word has not been received from the Department of Justice.

As far as possible the visiting of personnel files in each Bureau will be arranged at the same time as the group meetings.

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JAN 26 1937
U. S. Department of Agriculture

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

1937

UNDERGRADUATE COURSES IN "GRAPHIC PRESENTATION"
Instructors: H.A. Magnuson and E.A. Garlock

Four major study courses of this subject are now offered by the Graduate School of the U. S. Department of Agriculture. The subject has a three-fold purpose: First, training in graphic expression; second, developing draftsmen as designers and supervisors, whether in the architectural or the mechanical fields; third, training in the reading of blue prints and specifications. The cost per course will be $20.00 for each semester. Prerequisite, 15 standard high school units or equivalent.

Course I - FREEHAND DRAWING (year) Beginning January 26, Tuesdays 6:00 to 7:00 P.M. in Room 223 East Wing, Administration Building, and Wednesdays 7:00 to 9:00 P.M. in Room 0051 South Building.

1. Outline Drawing
2. Light and Shade
3. Illustrator's Perspective
4. Measured Drawing
5. Architectural Rendering
6. Graphs
7. Cartoons
8. Illustrations
9. Posters
10. Indications and Sketching
11. Mediums
12. Technique

Course II - ARCHITECTURAL DRAWING (year) Beginning January 25, Mondays 7:00 to 9:00 P.M. in Room 0051 South Building, and Thursdays 6:00 to 8:00 P.M. in Room 1039 South Building.

1. Planning
2. Exterior Treatments
3. Methods of Construction
4. Use of Materials

Course III - MECHANICAL DRAWING (year) Beginning January 26, Tuesdays and Thursdays 7:00 to 9:00 P.M. in Room 0051 South Building.

1. Elementary Mechanical Drawing
2. Descriptive Geometry
3. Advanced Mechanical Drawing
5. Mechanical Systems
   a. Electrical
   b. Heating & Ventilation
   c. Refrigeration & Air Conditioning
   d. Sanitation & Plumbing

Course IV - BLUEPRINT READING (year) Beginning January 25, Mondays and Fridays 5:00 to 6:00 P.M. in Room 1039 South Building.

1. Interpretation of Symbols
2. Reading Dimensions & Checking
3. Correlation of Drawing and Specification
4. Mechanical Requirements
5. Quantitative Analysis
6. Estimating Costs
7. U.S. Govt. Specifications

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U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
1937-38

The general circular of information relative to courses of instruction available in the Graduate School of the U. S. Department of Agriculture for year beginning September 20, 1937, may be obtained by sending name and address to Eva M. Johnson, Secretary, Graduate School, 4090 South Building, U. S. Department of Agriculture. The following courses are included:

Accounting: Elementary and Advanced
Administrative Law
Agricultural Prices
History of American Agriculture
Geography of Agriculture
Mathematical Preparation for Statistics:
Algebra
Trigonometry and Analytic Geometry
Mathematical Analysis
Calculus
Adjustment of Observations
Interpolation and Finite Differences (ONE MONTH INTENSIVE COURSE BEGINNING AUGUST 30th)
Elementary Statistical Analysis
Advanced Statistical Analysis
Statistics - Seminar
Statistical Theory and Method in Geographical Research
Principles of Economics
History of Economic Thought
Money and Banking
Contemporary Economic Problems
A Comparative Study of Current Economic Systems
Trade Unionism
Labor Law
Federal Jurisdiction and Procedure
Economics in French and German
The History of Social Thought and Theory
Rural Sociology
Political Economy and the Law
Economics of Instability
Lectures on Administrative Management (10 in all)
Extension Seminars
Extension Theses
Effective Speech
Plant Ecology
The Principles of Animal Pathology
Systematic Botany
Plant Breeding with Special Reference to Disease Resistance
An Introduction to Organic Chemistry
Advanced Inorganic Analytical Chemistry
Physiological Chemistry
Advanced Organic Chemistry
Soils: "Their Morphology, Genesis and Classification"

Glass Blowing (limited to 10 students)
Determinative Minerology
Climatology
Survey of Public Personnel Management
Management and Supervision
Architectural Drawing
Freehand Drawing
Mechanical Drawing
Blueprint Reading
Descriptive English Grammar
The Poetry of Robert Browning
Editing Manuscripts
Coaching Class in English and Letter Writing
Shorthand - Technical Speed Writing
German - Elementary, Advanced and Scientific
Russian- Elementary, Advanced and Scientific
Spanish- Elementary and Advanced
Italian- Elementary and Advanced
Comparative Nematology
Basic Photography

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

A. F. Woods.

A. F. Woods
Director, Graduate School

GRADUATE SCHOOL USDA FLIER USDA

LECTURES ON CURRENT ECONOMIC

PROBLEMS, a 274 page mimeograph containing 22 lectures by outstanding economists, is available for distribution by the Graduate School at $1.00 per copy. These lectures are well bound in a ring binder and contain sufficient material to fill an ordinary 500 page book.

Lectures were given in the auditorium during the 1935-36 school year. Lectures by the following are included: Dr. Alvin H. Hansen, Dr. Isador Lubin, Dr. Calvin B. Hoover, Dr. Jacob Viner, Dr. Max J. Wasserman, Dr. Eveline M. Burns, Dr. Josef A. Schumpeter, Mr. H. J. Wadleigh, Dr. Thomas C. Blaisdell Jr., Dr. E. A. Goldenweiser, Dr. H. Parker Willis, Dr. E. G. Nourse, Mr. Morris L. Cooke, Dr. Chas. W. Eliot II, Dr. David V. Saposs, Mr. Joseph B. Eastman, Mr. Robert L. O'Brien, Dr. Ernest S. Griffith, Dr. W.H.S. Stevens, Dr. Clarence Ayres, Dr. Harold S. Moulton, and Dr. Ernest Minor Patterson. Use coupon below.

STATISTICAL INFERENCE is the title given to a 51 page mimeograph which will be released by the Graduate School soon. This report contains 3 lectures with discussions which were given by Dr. R. A. Fisher of London this fall under the auspices of the School.

Employes of Agricultural Economics, the Agricultural Adjustment Administration, the Weather Bureau, Plant Industry, and the Forest Service in particular should be interested. Use coupon below.

ANNOUNCEMENT OF SECOND SEMESTER COURSES will be available for distribution about December 10. All persons interested are advised to order a copy of this announcement early. Use coupon below.

Dr. A. F. Woods, Director, Graduate School, Room 4090.

Dear Dr. Woods:

☐ (1) Enclosed you will find a check for $1.00 in payment for the 274 page mimeograph "Lectures in Current Economic Problems."

☐ (2) Enclosed you will find a check for 35¢ in payment for one copy of the three lectures with discussions which were given by Dr. R. A. Fisher, entitled "Statistical Inference."

☐ (3) Please send me the announcement of the second semester courses.

Signed . . . . . .

Bureau . . . . . .

Room . . . . . Br. . . . . .

OVER

GRADUATE SCHOOL USDA FLIER USDA

DISTINGUISHED POLISH GEOPHYSICIST, Dr. Henryk Arctowski, will give two lectures at the Department of Agriculture auditorium from 5:00 to 6:00 p.m. on December 2 dnd 3, 1936.

On December 2nd the lecture, which will be illustrated by lantern slides, will be on "Climatic Variations and Weather Cycles."

On December 3rd Dr. Arctowski will be the leader in a conference on the subject of "World Changes in the Distribution of Atmospheric Pressure and Study of the Maps of March, 1931." For this conference Dr. Arctowski will show and explain several world isallobaric maps.

Dr. Arctowski has conducted important investigations in several fields of geophysics, including oceanography, meteorology, geology, climatic fluctuations, etc. He was oceanographer and meterorologist with the Belgian Antarctic Expedition, 1897-99, and was associated with the Belgian Royal Observatory from 1904-09. Nine years, 1911-19, were spent as Chief of the Science Division of the New York Library. Since 1920 he has been professor of meteorology and geophysics at the Geophysical Institute at Lwow, Poland.

These two lectures, one of which is to be in the nature of a conference, while complete in themselves as to the subjects dealt with, will also form an appropriate introduction to a course in climatology which the Graduate School is planning to conduct later, probably during the present year. A charge of $1.00 will be made for the two lectures, or 50¢ for one alone, which payment will be credited toward the tuition fee in the case of those who register for the course in climatology to be given later. The coupon below may be used for registration.

Dr. A. F. Woods, Director, Graduate School, Room 4090

Dear Dr. Woods:

Please reserve an enrollment card for me as I wish to attend one both of the lectures which will be given in the Department auditorium by Dr. Henryk Arctowski at 5 p.m. on December 2 and 3. I will either send you a check or call in person before the lectures start.

If the lectures are published I would like to reserve a copy at 25¢. Yes. No.

Signed .....

Bureau .....

Room ..... Br. .....

OVER

F-L-I-E-R

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

DISCOVERING OURSELVES: PSYCHOLOGY TODAY

This course offers a broad outline of the most recent scientific study of human personality. Because of the importance of the insights here presented by a notable group of authorities, this series of lectures affords an exceptional opportunity.

The three introductory lectures given on March 2, 9, and 16, are to be followed by nine lectures treating of specific aspects of psychology. There is still an opportunity to register for this series. The lectures so far have proved to be very helpful and stimulating and have been enthusiastically received by an audience almost filling the auditorium.

THE SUBJECTS AND THE SPEAKERS

Auditorium - South Building
5 to 6 P.M.

PSYCHOLOGY IN THE EXPERIMENTAL LABORATORY — March 23
Dr. H. S. Langfeld, Professor of Psychology and Director of the Psychological Laboratory, Princeton University.

EXPLORING THE UNCONSCIOUS: THE METHODS AND ACCOMPLISHMENTS OF PSYCHOANALYSIS — March 30
Dr. Sandor Rado, Educational Director of the New York Psychoanalytic Institute.

(over)

MEASURING PERSONALITY — April 6

Dr. Mark A. May, Director, Institute of Human Relations, Yale University.

ON THE FRONTIERS OF MIND: RECENT RESEARCH IN EXTRA-SENSORY PERCEPTION — April 13

Dr. J. B. Rhine, Professor of Psychology, Duke University.

THE GROWTH OF OUR SOCIAL ATTITUDES — April 20

Dr. Gardner Murphy, Assistant Professor of Psychology, Columbia University; Chairman, Society for the Psychological Study of Social Issues.

THE PSYCHOBIOLOGY OF THE GREAT APES — April 27

Dr. Robert M. Yerkes, Professor of Psychobiology, Yale University, and Director of the Yale Laboratories of Primate Biology. Illustrated by lantern slides.

PSYCHOLOGY APPLIED: WHAT WE SHOULD KNOW ABOUT HUMAN NATURE — May 4

Dr. Daniel Starch, Consultant in Commercial Research, New York City; formerly Professor of Business Psychology, Graduate School of Business Administration, Harvard University.

THE RELATION OF PSYCHIATRY TO PSYCHOLOGY AND TO PRACTICE — May 11

Dr. Adolph Meyer, Psychiatrist-in-Chief, The Johns Hopkins Hospital.

THE OUTLOOK FOR FUTURE DISCOVERIES OF OURSELVES — May 18

Speaker to be announced.

Dr. Paul Kaufman will preside at the lectures.

Register in Room 4090 South Building from 8:30 a.m. to 5:00 p.m., Saturdays to 1:00 p.m. Enrollment fee $3.00. Reservations may be made by telephone or mail. Call DIstrict 6350, Extension 317.

(over)

GRADUATE SCHOOL USDA FLIER USDA

(1) TECHNICAL SHORTHAND SPEEDWRITING I (one semester) Mondays and Wednesdays at 4:45 p.m. to 5:45 p.m. in Room 2213 South Bldg. Instructor, Clara E. Richter. Dictation will be from 100 to 150 words per minute. Fee $12.00.

(2) TECHNICAL SHORTHAND SPEEDWRITING II (one semester) Mondays and Wednesdays 5:45 p.m. to 6:45 p.m. in Room 2213 South Bldg. Instructor, Clara E. Richter. Dictation will be at the rate of 130 to 170 words per minute. Fee $12.00

FRONTIERS OF ECONOMICS AND LAW will be the title of a course of 10 lectures to be offered by the Graduate School of the Department of Agriculture in cooperation with the School of Public Affairs of American University. All lectures will be outstanding authorities in their fields. This series of lectures will be held on Saturday afternoons at 1:45 p.m. in the Agriculture Auditorium. The fee for the lectures will be $3.00. A descriptive announcement will be circulated as soon as the course is ready which will be in the very near future.

OVER

GRADUATE SCHOOL USDA FLIER USDA

CLASSES IN TECHNICAL SHORTHAND SPEEDWRITING are now open for enrollment. The Graduate School is offering two speed classes. One class is offered for those stenographers writing around 100 words a minute and the other for persons who now write about 130 words a minute. Entrance examinations for these classes will be held February 12 in room 2213 at 4:45 p.m. Cards must be secured from the Graduate School to take the examination but the tuition of $12 will not be due unless the candidate qualifies.

THE CIVIL SERVICE COMMISSION will be asked to hold a promotional examination at the end of the semester. All persons in the Department, whether they enroll for the course or not, who are able to pass a qualifying examination at 150 words a minute at that time will be certified to take the promotional examination.

OVER

GRADUATE SCHOOL USDA FLIER USDA

LANDSCAPE DESIGNING (One semester) Beginning October 27 and continuing until March 2, omitting December 16 to January 7; thirty periods on Tuesdays and Thursdays at 4:50 P.M. Room 223 East Wing, Administration Building.

The course will cover general principles of Landscape Design with special reference to home surroundings, but including in general its application to other purposes. This includes the basic design including location of buildings, drives and utility features, also the location and character of plant groups. In addition there will be discussion of the specific plants to meet the different needs, not only in Washington, but in different parts of the country. Some special features will be discussed by specialists.

The course will be under the supervision of Furman Lloyd Mulford. Most of the subjects will be presented by trained landscape architects in various branches of the Government Service. It is expected that many who gave lectures last year will repeat them this semester. Among these were Joseph C. Gardiner, M. Kirkpatrick, John Paolano, A. H. Hanson, W. H. Simonson, Geo. B. Gordon, Architect Horace W. Peaslee, and commercial water lily specialist Mrs. L. Helen Fowler.

--OVER--

GRADUATE SCHOOL USDA FLIER USDA

Advanced research workers in GENETICS AND PHYTOPATHOLOGY interested in the field of breeding for disease resistance, should register promptly for the course in PLANT BREEDING WITH SPECIAL REFERENCE TO DISEASE RESISTANCE beginning Monday, October 12 at 4:50 P.M. and continuing Mondays and Fridays for 15 weeks, under the chairmanship of Dr. F. J. Stevenson, assisted by specialists. Prerequisite: B.S.Degree.

This is an unusual opportunity that should not be overlooked by those desiring to get the latest developments in this field. Register in Room 4090 South Building, U.S.D.A.

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The publication,"LECTURES IN CURRENT ECONOMIC PROBLEMS," is ready for mimeographing and will soon be available for distribution. This publication contains over 275 pages of printed matter which should be of value to everyone interested in problems in the field of economics and finance. Reservations may be made at $1.00 each at the office of the Graduate School, Room 4090 South Building.

- OVER -

USDA

GRADUATE SCHOOL BULLETIN

FLIER

USDA

AGRICULTURAL PRICES is the title of a course to be taught by Dr. F. L. Thomsen who is in charge of the Division of Statistical and Historical Research (BAE). This class will run through the year and be held on Mondays and Fridays at 4:50 P.M. starting September 21 in room 3863 South Bldg. Fee $12.00.

LANDSCAPE ARCHITECTURE will be taught again this year if sufficient requests are received. If you are interested communicate with the office of the Graduate School Room 4090 South Bldg., Branch 317..

SAFETY ENGINEERING will be offered if sufficient requests are received.

INTERNATIONAL TRADE will be offered by Dr. L. Volin on Tuesdays and Thursdays at 4:50 PM in Room 4090, South Bldg. Fee $12.00. The course will cover international trade, international payments, and commercial policies of the United States and foreign countries.

A COMPLETE LIST OF COURSES may be secured from the Graduate School, U.S.D.A. Room 4090.

OVER

BULLETIN

ORCHESTRA TO PLAY RUSSIAN MUSIC

Due to the tremendous popular demand for a repeat performance, and the accord given by the Washington daily newspapers, the Orchestra will repeat its program of Russian music in the Department Auditorium on WEDNESDAY, SEPTEMBER 23, at 8:30 PM.

The program features the second symphony of Borodine, a fine but rarely played work. Other interesting but more familiar numbers on the program are the "Andante Cantabile" from the String Quartet, Op. 11 by Tchaikowsky; the "Gopak" (Russian Dance) and the tone poem "Night on Bald Mountain, both by Moussorgsky; the "Musical Snuff Box" by Liadow; and the "Legend of Tsa Saltan" by Rimsky-Korsakow.

USDA GRADUATE SCHOOL USDA

FLIER

STENOGRAPHERS will be pleased to learn that the Graduate School will hold another examination for students who wish to enter the stenography class. The test will be held in room 0051, September 25 at 4:45 pm. 100 words minimum.

ECONOMIC SEMINARS will begin Friday, September 25 at 7 pm. in room 2050 South Building. Dr. Max J. Wasserman, Director of Finance, Resettlement Administration is the chairman. The fee for graduate students is $1.00.

EDITING MANUSCRIPTS on Agriculture, Home Making, and Related Subjects, M.W.F. at 4:50 pm. beginning September 14, fee $12.00; Instructor is Mr. Vernon E. Bundy.

THREE LECTURES IN STATISTICS by Dr. R. A. Fisher, start Monday, September 21 at 5 pm. in the auditorium. Fee is $2.00.

OVER

BULLETIN

The Athletic and Recreational Association is holding the first of a series of low-price dances in the Patio of the Administration Building on Saturday night, September 19. The price will be 25 cents per person.

Excellent music will be furnished by Otto's six-piece orchestra and the dance will be semi-formal. Anyone wishing to wear evening clothes may do so. In other words, wear anything you want.

Everyone will recall the popular dances of this type given by the Welfare Association last year. Each time the Patio was filled and a good time was had by everyone. Tickets at 25 cents per person may be purchased at the door only.

Remember the hours - 9 to 12 instead of 8 to 12 as stated in the Exchange.

OVER

GRADUATE SCHOOL *Flyer*

GRADUATE SCHOOL PROGRAM WILL BE READY ABOUT JULY 1

COURSES to be taught in the Graduate School during 1937-38 will be announced about July 1. All persons interested are urged to write to the Director of the Graduate School via chain envelope for a copy or call branch 317.

INTERPOLATION AND FINITE DIFFERENCES

Recognizing that more and more statisticians and economists wish to fortify themselves with a mathematical background the Graduate School has arranged a course entitled Interpolation and Finite Differences which will be taught by Dr. W. Edwards Deming. Furthermore the course will begin August 30 and end September 29 so as not to interfere with the regular winter studies of the prospective students. The fee for the course is $5.00. Classes will be held on Mondays and Wednesdays, 4:40 to 5:50 p.m., in room 2050. College algebra is a prerequisite.

OVER

ATHLETIC AND RECREATIONAL ASSOCIATION

BULLETIN

A proposal to rent the Carpenter property near Bluemont, Virginia for a cooperative vacation venture has been investigated by the officers of the A.R.A. and approved. Located fifty miles from Washington at the summit of the Blue Ridge this property has all modern conveniences and offers practically every type of recreation. General facilities include hiking on the Appalachian Trail and its side trails, tennis, French lessons, dancing, pool, swimming, and horseback riding. There are splendid accomodations for fifteen persons at a cost, including room, meals and general service, of about $60.00 per month.

A meeting will be held Friday, June 25th, at 4:45 p.m. in room 5724 South Building to discuss the matter and to arrange for a visit to the property Sunday June 27th.

OVER

U S D A GRADUATE SCHOOL U S D A

FLIER

INSURANCE: The Graduate School has under consideration a series of two lectures on Insurance by Dr. Alfred Manes, formerly of the University of Berlin and now visiting professor of Insurance at Indiana University. One lecture might possibly deal with the evolution of different forms of insurance and extent of their use throughout the world, and the other might deal with the theory and practice of insurance. Opportunity will be available for conferences. If you would be interested in two such lectures at a combined cost of one dollar ($1.00), please notify the Graduate School Office, Room 4090, telephone Br.317.

This is merely an inquiry to determine whether there is sufficient demand for such lectures to justify making of arrangements.

O V E R

USDA GRADUATE SCHOOL USDA
FLIER

RETIREMENT: Beginning Thursday, May 13, Mr. Ulrey J. Biller, Fifth Vice-President of the National Federation of Federal Employees, will conduct a short course of study of the retirement law. Tuition free.

The object will be to give an understanding of the details of the present legislation, with special reference to how it applies practically and to possible changes in the law.

The course is open to all members of the Department of Agriculture who wish to enroll, up to a maximum of 200. It will be given on five (5) successive Thursdays - May 13, 20, 27, June 3 and 10, from 4:50 to 5:50 P.M. in the Auditorium of the South Building. Register at room 4090.

Mr. Biller is a master of the subject of retirement and had much to do with obtaining the present law. No one is better qualified to illuminate its provisions as they affect the employees of the Department. (Mr. Herbert A. Smith, Chairman).

O V E R

G R A D U A T E S C H O O L F L Y E R

TEN LECTURES ON ADMINISTRATIVE MANAGEMENT

Fridays beginning October 1, from 5 to 6 P.M. in the Auditorium, South Building, Department of Agriculture

Ten leaders in this field have been secured. They include Dr. Ordway Tead, Dr. H. S. Person, Col. George Babcock, Secretary E. G. Draper, Edgar W. Smith, Robert B. Wolf, Mrs. W. F. Greenbough, Dean W. B. Donham, and others to be selected.

Secretary Wallace endorses the course as follows:

"The Administrative Management of the Government Needs Overhauling"

"The above statement is quoted from the President's message to Congress, January 12, 1937. As Government employees, it behooves us all to inform ourselves on what is meant by Administrative Management -- its principles and techniques. In order that we may all do so, I asked Dr. Woods to plan a course of instruction and invite the best speakers the country affords.

This series of lectures is the result. I hope there will be much departmental and individual profit from them." (signed) Henry A. Wallace, Secretary.

Register in Room 4090 South Building from 8:30 a.m. to 5 p.m.; Saturdays to 2 p.m. Reservations may be made by telephone or mail. SEND FOR CIRCULAR WITH FULLER INFORMATION. Enrollment fee $5.00

(over)

G R A D U A T E S C H O O L F L Y E R

FOREIGN TRADE PROBLEMS AND POLICIES IN RELATION TO AGRICULTURE
(year) Mondays and Wednesdays beginning September 27 at 4:50 P.M.
Instructors: L. A. Wheeler, assisted by specialists.

The object of this course is to present for discussion and analysis certain fundamental aspects of the foreign trade trends and policies of the United States and of the agricultural policies of foreign countries as they relate to American agriculture. While one or two lectures on international trade theory will be given and selected readings assigned early in the course to provide a general background, the course is intended primarily for graduate students who have already had some training in theory.

First semester: Among the topics to be considered will be:

1 - The significance of foreign trade to American agriculture
2 - Long time and recent trends in United States agricultural exports and imports
3 - The relation between agricultural and total exports
4 - The United States balance of international payments
5 - The tariff in relation to agriculture
6 - Export subsidies and countervailing duties
7 - Reciprocal trade agreements

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SOCIAL PSYCHOLOGY (one semester) Tuesdays and Thursdays, beginning October 12, 7:30 - 9:00 P.M. Instructor: Dr. Paul Kaufman, formerly of Yale University.

The program of this course is arranged in two divisions: the psychology of group behavior and the social development of the individual.

GENERAL PSYCHOLOGY (year) Tuesdays and Fridays, beginning October 12, 5 P.M. to 6:50 P.M. 6 semester credits for year. Instructor: Dr. Paul Kaufman.

A general survey of the nature of human personality, studied by scientific methods. Following a preliminary outline of the leading current schools of psychological thought, presented in the perspective of older views of personality, the course proceeds to a description of the nervous system and sense organs. Analysis is then made of the elements of behavior at various levels. Among the processes examined are perceiving, imagining, learning, remembering, feeling, and thinking, with special attention to motivation in the emotions.

THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE
WASHINGTON

Announces two lectures by

Mr. W. G. Cochran
Statistical Department
Rothamsted Experimental Station

Jan. 3d, The function of randomization in experimental design. Objects of experimental design Randomization and tests of significance. Unbiased estimates of error and their uses. Type of randomization necessary to secure unbiased estimates of error. Examples. Systematic vs. randomized designs.

Jan. 4th, The concept of "information" in statistics. Information in normal and large sample theory. Practical uses: statistical costing, rapid reduction of data. Examples: mean of a symmetrical distribution, rank correlation. Mathematical definition of information. Connection with the popular definition. Meaning of information in small samples. Examples. Information different for different purposes. Further development of theory.

Place: Room 1039, Dept. of Agriculture.

Time of day: 5 o'clock

Tickets: $1 for two lectures; pay at the door, or secure tickets in advance at the office of the Graduate School, or from the undersigned.

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Mr. Cochran will be available for conferences during certain portions of his stay here. Those interested in talking over special problems should communicate with Dr. Brandt (Agric. Br. 5454). Discussion groups may be arranged if several people seem interested in the same topics.

A. E. Brandt

Charles F. Sarle

W. Edwards Deming

U. S. Department of Agriculture

Graduate School

PERSONNEL MANAGEMENT (one semester). Mr. Peter Keplinger, 5110-A South, Chairman, beginning September 16 on Mondays and Wednesdays at 4-45 P.M. This course is a continuation of the elementary course of last year and is open only to students having completed that course. Registration will be limited to two sections of 40 each. Its aim is to train students in the effective methods of approach to personnel problems as related to government service. The project and conference methods of instruction will be followed and an attempt will be made to adapt the most progressive methods of industry to public service use.

Projects will be selected that involve problems in employee representation, conciliation committees, employee organizations, employee service programs, training on the job and training for advancement for worker, supervisor, and executive; position analysis and classification, placement and transfer, career service programs, efficiency determination, performance standards, and studies leading to the development of personnel policy. Fee for the course - $12.00.

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EXECUTIVE MANAGEMENT AND SUPERVISION (one semester) Mr. Peter Keplinger, 5110-A South, Chairman, beginning January 14 on Tuesdays and Thursdays at 4:45 P.M. Registration will be limited to two sections of 40 each. This course aims to train studens in effective methods of approach to executive and supervisory problems as related to government business. It is not a study of standard procedures now in use in government departments but a study of principles and trends, drawing freely on the experience and the literature of industry.

The project method will be followed. Projects will be selected in the fields of organization, problem analysis leading to executive decision, training, and production control, including job analysis, standardization, job specifications, work planning, and measure of performance. Prerequisites: Training or experience for this type of work as determined by conference with Director or Chairman of the course. Fee for the course $12.00.

UNITED STATES DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

SPECIAL LECTURES BY PROFESSOR R. A. FISHER, UNIVERSITY COLLEGE, LONDON, ENGLAND

Professor Fisher has been engaged to give three lectures under the auspices of the Graduate School, U. S. Department of Agriculture, on September 21, 22 and 23, Monday, Tuesday and Wednesday, from 5 to 6 P.M. in the Auditorium, South Building, Department of Agriculture.

The lectures will deal in a general way with Statistical Inference with special emphasis on sampling and the statistical testing of hypotheses. The lectures will be followed by discussions.

Special arrangements are being made also for conference groups interested in particular aspects of statistical analysis. Those desiring to attend conference groups should confer either with Mr. B.R. Stauber, or Dr. W. Edwards Deming.

A fee of $2.00 will be charged for these lectures, or conferences, or both. Those wishing to attend the lectures must register either by mail or in person in Room 4090 South Building.

GRADUATE SCHOOL FLYER

Current Economic Problems II ,

RELATION OF GOVERNMENT TO ECONOMIC LIFE

Department of Agriculture Auditorium

Date	Speaker	Subject
March 7, Sat. 2 P.M.	Thomas C. Blaisdell, Jr. ..... Economic Adviser to Administrator of Resettlement Administration	INTRODUCTION
Mar. 14, Sat. 2 P.M.	Gardiner C. Means..... Director, Industrial Section, National Resources Committee	BUSINESS CORPORATIONS
Mar. 28, Sat. 2 P.M.	E. A. Goldenweiser..... Director, Division of Research and Statistics, Federal Reserve System	MONETARY CONTROL I
Apr. 4, Sat. 2 P.M.	H. Parker Willis..... Professor of Banking, Columbia University	MONETARY CONTROL II
Apr. 11, Sat. 2 P.M.	E. G. Nourse..... Director, Institute of Economics, Brookings Institute	AGRICULTURE
Apr. 16, Thur. 8 P.M.	Morris L. Cooke..... Administrator, Rural Electrification Administration	POWER
Apr. 18, Sat. 2 P.M.	Ernest Minor Patterson..... Professor of Economics, University of Pennsylvania	TAXATION
Apr. 23, Thur. 8 P.M.	Charles W. Eliot II..... Executive Officer and Director of the National Resources Committee	RESOURSES
Apr. 25, Sat. 2 P.M.	David J. Sapos..... Head, Statistical Division, National Labor Relations Board	LABOR
May 2, Sat. 2 P.M.	Joseph B. Eastman..... Federal Coordinator of Transportation	TRANSPORTATION
May 9, Sat. 2 P.M.	Robert L. O'Brien.....	INTERNATIONAL ECONOMIC RELATIONS
May 14, Thurs. 8 P.M.	Ernest S. Griffith..... Dean of Graduate School, American University	SOCIAL SECURITY
May 16, Sat. 2 P.M.	Philip M. Glick..... Chief, Land Policy Section, Office of Solicitor, Dept. of Agriculture	LEGAL BASIS OF BUSINESS REGULATION
May 23, Sat. 2 P.M.	.....	MONOPOLY
June 6, Sat. 2 P.M.	Clarence E. Ayres..... Director, Consumers Division, Department of Labor	CONSUMPTION

FEE FOR ANY 5 LECTURES IS TWO DOLLARS

FEE FOR ANY 2 LECTURES IS ONE DOLLAR

Register at Room 4090 South Building, Department of Agriculture, or at the Auditorium at the time of the lecture.

Purpose of the lectures is to stimulate interest in contemporary economic problems.

OVER

GRADUATE SCHOOL FLYER

ELEMENTS OF PERSONNEL ADMINISTRATION

Department of Agriculture Auditorium

Date (Fridays 5 P.M.)	Speaker	Subject
April 3	Whiting Williams Author and Consultant	INTRODUCTION
April 10	William E. Mosher Syracuse University	THE ART OF MANAGEMENT AND ITS RELATION TO PERSONNEL ADMINISTRATION
April 17	Boyd Fisher Rural Electrification Administration	NON-FINANCIAL INCENTIVES
April 24	Harry Farquhar Forest Service	THE TECHNIQUES OF SUPERVISION
May 1	James H. Greene Author and Consultant	EMPLOYEE TRAINING
May 8		EMPLOYEE REPRESENTATION
May 15		THE RELATION OF PROFESSIONAL PERSONNEL ADMINISTRATION TO THE CAREER SERVICE IDEA
May 22		PSYCHIATRY - APPLICATION TO THE FEDERAL SERVICE
May 29		COMPLAINTS, CONCILIATION AND DISCIPLINE
June 5	Carleton R. Ball Executive Secretary, Coordinating Committee, U.S.D.A., T.V.A., and Land Grant Colleges	SUMMARY - HOW INFORMATION GAINED CAN BE USED TO BETTER THE FEDERAL SERVICE

Purpose of this course is to introduce government employees to the science of personnel administration and to stimulate more general interest in the subject.

Register at Room 4090 South Building or at the Auditorium at the time of the lecture.

FEE FOR ANY 2 LECTURES IS ONE DOLLAR

This course as well as the one in Current Economic Problems is given by the Department of Agriculture Graduate School in cooperation with American University.

OVER

FREE INTRODUCTORY LECTURE FREE

FRIDAY APRIL 3, 5 P.M. AGRICULTURE AUDITORIUM

You Should Register At Once If You Wish To Take The Rest Of The Lectures

Last year, 766 Department employees jammed the registration list for this course in Personnel Management given by the U.S.D.A. Graduate School, under the direction of Peter Keplinger, in charge of Personnel Management of the U. S. Forest Service. More than 200 executives and clerks had to be turned away because of lack of space in the auditorium.

WHITING WILLIAMS

Whiting Williams Will Stress Human Side Of Supervisors' Problems

Known throughout America and Europe for his work as an industrial consultant and authority on supervisor-employee problems, Whiting Williams has rolled up his sleeves and sweated in mines and factories on two continents. He knows how both sides think, feel and act. Result: he has made employers and employees see eye-to-eye. He opens up new lines of thought on fundamental problems of personnel management. A colorful personality with a wealth of human experience, Mr. Williams provides the introduction to the second series of classes in "Elements of Personnel Administration". He will be followed by Dr. William E. Mosher, Dean of the School of Citizenship of Syracuse University, on April 10. Dr. Mosher is the author of many books on public service as a career and on municipal and governmental employment. His latest book will deal with employment management in the British Empire. He will lecture on "The Art of Management". Other lecturers to be announced later.

WHAT IS A COURSE IN "PERSONNEL ADMINISTRATION"? -- Those responsible for the production of others constantly face problems in management, training and discipline of employees. Employees have their problems too. This course covers all angles of this relationship with a view to benefiting both -- and of raising the value of the work accomplished.

WHO CAN SIGN UP FOR THIS COURSE? -- The course is open to all Government employees. Registration is being limited only by the seating capacity of the Auditorium.

WHAT WILL I GET OUT OF THIS COURSE? -- A general understanding of this interesting subject and university credit as a regular course in the Graduate School, if you desire.

WHEN, WHERE, AND HOW MUCH? -- Classes will be held at the Department of Agriculture Auditorium each Friday afternoon at 5 o'clock. Registration can be completed at Room 4090, South Building (Branch 317), the office of Dr. A. F. Woods, Director of the Graduate School. Course runs from April 3 to June 5. Registration fee -- 00.

F-L-I-E-R

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

The lecture in the Conservation of Health series on February 15, in the auditorium of the South Building at 4 o'clock, will be by Mr. Ross Garrett, Coordinator of Public Health Facilities in the District of Columbia. This will interest government employees generally, and all are invited to attend without charge so far as the auditorium will permit. The lecture will be on "Health Facilities Available in the District of Columbia - How to Use Them and Obtain Their Services."

Plans for the last lecture of the series will be announced at the February 15th lecture. The final lecture will deal with the "Conservation of Hearing."

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A publication that may interest you is a new book entitled - LECTURES AND CONFERENCES ON MATHEMATICAL STATISTICS - delivered by J. Neyman at the Graduate School of the U. S. Department of Agriculture in April 1937. The book has been revised and supplemented by the author with the editorial assistance of W. Edwards Deming. Price $1.25.

Lectures

I - - On the Theory of Probability
II - On Probability and Experimentation
III - On the Testing of Statistical Hypotheses

Conferences

On Randomized and Systematic Arrangements of Field Experiments
On Certain Problems of Plant Breeding
On Statistical Methods in Social and Economic Research
Census by Sampling and Other Problems
On Time Series Analysis and Some Related Statistical Problems in Economics
On Statistical Estimation
Practical Problems and Various Attempts
to Formulate Their Mathematical Equivalents
An Outline of the Theory of Confidence Intervals

(over)

F-L-I-E-R

THE GRADUATE SCHOOL OF THE DEPARTMENT OF AGRICULTURE

through the kind cooperation of

THE BELL TELEPHONE LABORATORIES, INC.

announces a course of

FOUR LECTURES

by

WALTER A. SHEWHART, Ph.D.

THE STATISTICAL METHOD FROM THE VIEWPOINT OF QUALITY CONTROL

Place: The Department of Agriculture Auditorium

Subjects and dates:

1. STATISTICAL CONTROL, Monday, 28th February, 5 p.m.
2. HOW ESTABLISH LIMITS OF VARIABILITY? Tuesday, 1st March 5 p.m.
3. HOW PRESENT THE RESULTS OF MEASUREMENTS OF PHYSICAL PROPERTIES AND CONSTANTS? Thursday, 3d March, 5 p.m.
4. THE SPECIFICATION OF ACCURACY AND PRECISION, Friday, 4th March, 5 p.m.

Registration: Register at the Graduate School (Room 4090) in advance if possible; no fee will be charged, since the lectures are made possible through the generosity of the Bell Telephone Laboratories, Inc. For circular of detailed information write or call the Graduate School (Agriculture, Room 4090, Branch 317).

(over)

THE U. S. DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL
IN COOPERATION WITH
THE SCHOOL OF PUBLIC AFFAIRS OF THE AMERICAN UNIVERSITY

A. F. Woods, Director
Graduate School

A. S. Flemming, Director
School of Public Affairs

Announcement of "In Service" Training Courses in Personnel Management

In light of the interest of the United States Department of Agriculture Graduate School and the School of Public Affairs of The American University in certain aspects of public personnel work, it has been decided to offer two courses -- Public Personnel Management and Technique of Supervision -- on a cooperative basis. Persons desiring to enroll for either one of these courses may do so by filing their applications with either the Director of the Graduate School of the Department of Agriculture, or the Director of the School of Public Affairs of The American University.

A description of the two courses, both of which will be held for the first time during the week beginning September 23, and the method of instruction follows:

Public Personnel Management - Dr. Olson, Mr. Keplinger

The subject matter will include a statement and analysis of the principles and practices of personnel agencies; the historical background of American Personnel management; the rise and development of unions in the public service; the organization of Personnel Administration; general problems of recruitment; technique of testing; certification; classification; training; transfer and promotion; lay-off and reinstatement; efficiency records; welfare activities, sick leave, annual leave; political activity; service ethics; morale; discipline; conciliation boards and boards of review; retirement; interrelation of departmental personnel officers and the Civil Service Commission; the professional status and interests of public personnel managers; elements of a career service.

The plan of instruction provides for lectures by outstanding leaders each with a national reputation in some phase of the subject, and discussion of questions presented. On Mondays the time will be divided equally between the two types of procedure. In addition the group will be divided into sections meeting as clinical discussion groups on alternate Wednesday evenings where persons expert in particular subjects drawn from various government departments will act as technical advisors and consultants in the consideration of questions pertinent to the subjects announced. Completion of reading assignments, projects and examinations will be required for those desiring to receive credit.

Monday, 5 to 6:30 p.m. -- Department of Agriculture Auditorium
Alternate Wednesdays 5 to 6:30 p.m. -- Room 5110 A-South Bldg. Dept. of Agr.
Two semester hours credit - Fee: $12

Technique of Supervision - Dr. Olson, Mr. Keplinger

The subject matter will include a consideration of effective methods of approach to executive and supervisory problems as related to government business; types of organization as they effect supervision; training; job analysis; job specifications; standardization; production control; measure of performance; unit costs; rating scales. In addition to a study of standard procedures now in use in government departments considerable emphasis will be placed on principles and trends, drawing freely on the experience and literature of industry as well as of the government.

Plan of instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject, and classroom discussion of questions presented. Completion of reading assignments, special projects and examinations will be required for those desiring credit.

Tuesday, 5 to 6:40 p.m. -- Room A, 1905 F Street, N. W.
Two semester hours credit - Fee: $12

Additional Courses

In addition to the above courses, the School of Public Affairs, in connection with its "In Service" Training Program, is offering additional courses in this field. Persons associated with the Department of Agriculture and other government departments are cordially invited to participate in any of these courses. A description of the courses follows:

Problems of Administration Common to all Departments Arising out of Their Relationships to Other Departments and the Public - Dr. Olson

The subject matter concerns itself with the administrative principles and technique necessary to the efficient transaction of business with the Budget Bureau, Civil Service Commission, Procurement Division of the Treasury, Government Printing Office, Attorney General, Comptroller General, Legislative Committees, other government officers, and the public, including citizen delegations and the press.

Plan of instruction: Representatives of the various agencies concerned as well as outstanding administrators will lead the discussions. Completion of reading assignments, special projects, and examinations will be required for those desiring credit.

Monday, 7:30-9:10 p.m. - Room A, 1905 F Street, N. W.
Two semester hours credit - Fee: $15

The Development, Installation, and Administration of Classification and Compensation Plans - Mr. Baruch

Basic principles of the classification of positions; relation of a classification plan to other phases of personnel administration; methods of developing classification and compensation plans in public jurisdictions; problems of installation; principles and methods of administration; the technique of analyzing the duties and responsibilities of positions for purposes of classification.

Wednesday, 7:30-9:10 p.m. - Room A, 1905 F Street, N. W.
Two semester hours credit - Fee: $15

Administrative Statistics of the Federal Government - Their Collection and Use in the Formulation of Policies - (Instructor to be announced)

The course aims to survey the statistical work of the Federal Government as a whole. Emphasis will be placed on two main problems: The use of statistics in the making of administrative decisions, and on the work of agencies responsible for gathering and publishing statistical data.

At each meeting a lecture will be given by an economic analyst or a statistician in the Government service. Each lecturer will present material that has developed in his particular field of statistical work. Discussion by members of the group will follow each lecture.

Thursday, 7:30 to 9:10 p.m. - Room A, 1905 F Street, N. W.
Two semester hours credit - Fee: $15

Seminar in Housing and Home Financing - Dr. Fisher

(For description of course consult special Bulletin of School of Public Affairs.)

First and Second Semesters - Wednesday 6:15-8:45 p.m.
Room A, 1901 F Street, N. W.
Three semester hours credit - Fee: $30

Introducing -- The Staff Members

Mr. Peter Keplinger needs no introduction to Department of Agriculture employes as he was in charge of the lectures in the field of Public Personnel Management which were given last Spring. Associated with him will be Dr. Emery Olson, formerly Dean of the School of Government of the University of Southern California, and now Professor of Public Administration and Director of the "In Service" Training Division of the School of Public Affairs.

Ismar Baruch is known to thousands of Government employes as the Chief of the Division of Personnel Classification of the United States Civil Service Commission. Dr. Ernest M. Fisher is the Director of the Division of Economics and Statistics of the Federal Housing Administration.

Additional Information

Persons desiring additional information regarding this work may write or 'phone for the School of Public Affairs Bulletin. The address is: Secretary, School of Public Affairs, 1901 F Street, N. W. The 'phone number is: MEtropolitan 2300

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GRADUATE SCHOOL FLIER

LIBRARY
BUREAU OF AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE

THE FRONTIERS OF LAW AND ECONOMICS

A series of lectures under the joint auspices of the American University and the Graduate School of the Department of Agriculture.

	Date	Speaker	Subject
1.	February 20	WALTON HALE HAMILTON	"Property and the Law"
2.	" 27	H. S. JENNINGS	"Some Biological Generalizations and Their Import to Social Organization"
3.	March 6	GARDINER C. MEANS	"Corporation Economics & Corporation Law"
5.	March 20	NORMAN L. MEYERS	"Administrative Law & Oil Control"
6.	" 27	JOSEPH B. EASTMAN	"The Railroad Problem after Fifty Years"
7.	April 3	KARL N. LLEWELLYN	"Sales Law and the Economics of the Market"
4.	March 13	DONALD R. RICHBERG	"The Lawyer and National Administration of Economics Legislation"

OVER

GRADUATE SCHOOL

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8. "The Administration of Anti-Trust Legislation" (Speaker and date to be announced)

9. TO BE ANNOUNCED 10. TO BE ANNOUNCED

The lectures will be held on Saturday afternoons at 1:45 p.m. in the Auditorium of the Department of Agriculture Building

FEE FOR THE SERIES $3

Tickets may be purchased in advance at the office of the American Unitersity School of Public Affairs (1905 F Street - Metropolitan 5080), in the office of the Graduate School of the Department of Agriculture (Room 4090, South Building - District 6350, Branch 317), or at the entrance to the Auditorium preceding the lectures.

For further information, write
The Graduate School,
Department of Agriculture.

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GRADUATE FLIER SCHOOL

LECTURES ON DEPARTMENT OF AGRICULTURE OBJECTIVES

Mimeographed lectures on "Department Objectives" are now ready for FREE distribution to those persons registered for the lecture series

CONTENTS

1.	Dr. C. W. Warburton -	Extension Service Objectives
2.	Dr. Carleton Ball -	History of the Department and the development or growth of its objectives
3.	Dr. Albert G. Black -	Economic Objectives - the place of the Department in the American economic system and the ideals toward which it is working
4.	Mr. Milton S. Eisenhower-	The organization of the Department - as a means of carrying out objectives. How and why its form of organization is adapted to its purpose
5.	Dr. Howard R. Tolley -	The future of the Soil Conservation Program
6.	Dr. W. W. Stockberger -	Personnel objectives and how they contribute to Department objectives
7.	Dr. John R. Mohler -	Scientific - Why the scientific research and its general purpose. Why and how it contributes to the general public
8.	Mr. M. G. White -	The objectives of the regulatory work of the Department
9.	Dr. L. C. Gray -	Conservation and planning the use of land - what it means and its relation to the nation's future prosperity
10.	Prof. M. L. Wilson -	The place of the Department in the evolution of agricultural policy
11.	Hon. Henry A. Wallace -	General social and economic objectives of the Department. What we are trying to do for the people of the United States, why it should be done and why it can best be done by centralized effort

Persons desiring copies of the above lectures who were not registered in the series may obtain them for 50 cents. Copies can be secured at Room 4090 - South Building.

OVER

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THE FRONTIERS OF LAW AND ECONOMICS

$2 FEE FOR REMAINING LECTURES $2

V	March 20	Norman L. Meyers Formerly Member and Executive Secretary of Petroleum Administrative Board and Chairman of the Federal Tender Board.	Administrative Law and Oil Control
VI	March 27	Joseph B. Eastman Member Interstate Commerce Commission, formerly Co-ordinator of Transportation	The Railroad Problem after Fifty years
VII	April 3	Karl N. Llewellyn Professor of Law, Columbia University	Sales Law and the Economics of the Market
VIII	April 10	Donald R. Richberg Formerly Executive Director, National Emergency Council, and Chairman of N.R.A. Board	The Lawyer and National Administration of Economics Legislation
IX	April 17	William O. Douglas Commissioner, Securities and Exchange Commission	Administrative Procedures of the Securities and Exchange Commission
X	April 24	Walton Hale Hamilton Director of Bureau of Research and Statistics, Social Security Board, and Professor of Law at Yale University	Property and the Law
XI	May 1	Leon C. Marshall Professor of Political Economy, American University; Visiting Professor of Education, Johns Hopkins University	Professional Training in a Changing Social Organization

LECTURES ARE HELD IN THE DEPARTMENT OF AGRICULTURE AUDITORIUM. REGISTER IN ROOM 4090 OR AT AUDITORIUM

OVER

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

EDUCATIONAL COURSES - 1936-37

Second Semester Beginning January 11, 1937

The Graduate School of the United States Department of Agriculture will open the second semester of the 1936-37 school year the week beginning January 11. Classes will meet in the Department buildings at 4:45 P.M. or as soon thereafter as the students assemble. The tuition will be $12.00 a semester for two hour a week studies and $15.00 a semester for three hour a week studies, except as otherwise indicated. Registration fee for classes discontinued on account of small registration will be returned. Students withdrawing from classes having 15 or less will not be entitled to refund. A $2.00 registration fee is retained in case of withdrawal from continued classes. Cash refunds will not be made after the second week, but credit for the amount will be carried for later registration.

REGISTER IN ADVANCE. No one will be admitted to class without a registration card.

The Congress of the United States has made special provision for making the facilities for study and research in the Government Departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe. (27 statutes 395 and 31 statutes 1010). Under this authority and the provisions of the Organic Act establishing the Department a School of Graduate Studies was organized in 1920 for the benefit of Department employees and such others as are qualified to undertake the work offered.

The work is organized on a standard college basis and certificates of credit for the work accomplished are issued on a standard unit basis. This work has been accepted by graduate schools of accredited colleges and universities wherever it fits in to the approved program of the students. Certain courses as indicated are conducted in cooperation with the School of Public Affairs of American University.

The plan provides first for work by graduate or advanced students by special arrangement through the graduate schools of accredited colleges with the Graduate School of the Department of Agriculture for the utilization of the available facilities of Government laboratories and collections, in the study of an approved problem under the general supervision of a qualified government specialist.

The second type of work is formal class and laboratory work conducted after 4:30 P.M. or 1 P.M. Saturdays in such subjects as may be helpful to government workers. Everything necessary is done to insure the highest standard of work so that it may be satisfactory to the Government and cooperating colleges.

The Graduate School certifies credits earned. Acceptance, of course, depends on the rules of the college to which the credits are presented. The instructors are selected from the best qualified members of the scientific and professional staffs of the various Bureaus and nearby cooperating colleges. They are, of course, mostly

in the Civil Service and hold their positions by reason of merit. They compare favorably with the staffs of the leading colleges and universities from which most of them were originally drawn.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

Special series of lectures not included in this preliminary statement will be announced from time to time as plans for them are completed.

The latest catalogues of universities and colleges are available for consultation in the Office of the Direcotr, room 4090, South Building. Inquiries regarding the school should be addressed to:

A. F. Woods
Director, Graduate School
U. S. Department of Agriculture
4090 South Building.

Students who have not taken the first semester and who desire to enter the second semester, must satisfy the instructor that they have the necessary preparation.

INDEX OF COURSES

Page

Accounting -
- Principles of - (Beginning Class) 14
- Principles of - (Second semester) 14
- Federal Accounting Procedures 22
- Federal Regulation of Corporate Accounting 22

Advanced Inorganic Analytical Chemistry 15
Agriculture, History of American 6
Agricultural Prices 23
Botany, Systematic 16
Climatology 15
Colloids 16
Comparative Nematology 16
Economics -
- Contemporary Economic Problems 7-8
- Economics in German 11
- Evolution of Economic Institutions 11
- Graduate Seminar in General Economics 7
- History of Economic Thought 6
- International Trade 10
- Principles of Economics 11
- Wages and Economic Insecurity 8

Extension Theses 18
Extension Seminars 18
Federal Jurisdiction and Procedure 6
Geography of Agriculture 15
Glass Blowing 17
Landscape, Appreciation of Design 20-21-22
Languages -
- English Grammar and Rhetoric - (Beginning Class) 18
- French, Elementary Scientific 19
- French, Advanced Scientific 19
- German, Elementary 19
- German, Advanced and Scientific 19
- Italian, Elementary 19
- Russian, Elementary 19
- Russian, Advanced 19
- Spanish, Elementary 19
- Spanish, Advanced 19

Management and Supervision 5
Mathematics -
- Mathematical Preparation for Statistics - Algebra 14
- Trigonometry and Analytic Geometry 14
- Adjustment of Observations 13

Microscopic Technique and Histology 18
Organic Chemistry, An Introduction to 16
Organic Chemistry, Advanced 16
Physiological Chemistry 15
Political Economy and the Law . . . . . 9 - 10
Soils, Their Morphology, Genesis and Classification 17

(continued next page)

INDEX OF COURSES

	Pages
Statistics -	
Introduction	12
Advanced	12 - 13
Advanced Course for Biological Workers	13
Administrative Statistics of the Federal Government - Their Collection and Use in the Formation of Policies	22
Survey of Public Personnel Management	5

SPECIAL TRAINING COURSES NOT FOR COLLEGE CREDIT

Basic Photography	24
Mechanical and Architectural Drawing	24
Public Speaking	24
Technical Shorthand Speed Writing	24

*SURVEY OF PUBLIC PERSONNEL MANAGEMENT--Dr. Emery E. Olson. 1905 F St., N.W. Tuesdays - 5 to 6:40 P.M.

The following is a brief outline of the subject-matter of the course:

I. Historical Background of American Personnel Management
II. Rise and Development of Unions in Public Service
III. Organization of Personnel Administration
IV. General Problems of Recruitment
V. Technique of Testing
VI. Certification
VII. Classification
VIII. Training
IX. Transfer and Promotion
X. Lay Off and Reinstatement
XI. Efficiency Records
XII. Discipline
XIII. Welfare Activities
XIV. Political Activities and Service Ethics
XV. Conciliation Boards and Boards of Review
XVI. Retirement
XVII. Elements of a Career Service

Plan of Instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Classroom discussion under leadership of Dr. Olson.

Two semester hours credit--Fee $15.

*MANAGEMENT AND SUPERVISION--Dr. Emery E. Olson and Mr. Peter B. Keplinger 1905 F St., N.W. Mondays - 7:30 to 10 P.M.

The following is a brief outline of the subject-matter of the course:

I. Methods of Approach
II. The Relationship of General Organization to Management and Supervision
III. Work-Planning, Scheduling and Follow-Up
IV. Job Analysis and Time Studies
V. Job Specifications
VI. Standard Practice, Instructions, Routine and Procedures
VII. Administrative Control (records, reports, inspection, etc.)
VIII. Coordination and Cooperation (including relationships arising out of line and staff functions)
IX. The Process of Executive Decision
X. Performance Records (group and individual rating scales, unit costs, etc.)
XI. Incentives and Employee Relations
XII. Training
XIII. Bases of Leadership

Plan of Instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Classroom discussion under leadership of Dr. Olson and Mr. Keplinger.

Three semester hours credit--Fee $22.50

*In cooperation with American University.

FEDERAL JURISDICTION AND PROCEDURE (one semester) Mondays and Wednesdays, beginning January 18 at 4:50 P.M., in Room 5944 South Building. Instructor: Elmer D. Hays, A.B. and LL.B.

This course will deal with the original and limitations of the jurisdiction of the federal courts; their constitutional and statutory authority and their function in interpreting and developing the constitution, treatise and laws of the United States. In broad outline, the subject matter to be covered by these lectures will be as follows:

(1) The origin and limits of the jurisdiction of the federal courts.
(2) The Supreme Court and its jurisdiction.
(3) History and origin of inferior federal courts.
(4) Civil controversies over which the federal courts have exclusive jurisdiction.
(5) Cases arising under the constitution.
(6) Removal of cases from state to federal courts.
(7) Habeas corpus.
(8) Appelate jurisdiction of the federal courts.

HISTORY OF ECONOMIC THOUGHT (second semester) Mondays and Wednesdays, beginning January 11 at 5 P.M. in Room 4649 South Building. Instructor: Dr. Max J. Wasserman.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity; Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresmo. The Merchantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Rivere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill. The Socialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Kneis, Hillebrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics -- Veblen, Pigou, J.M. Clark, J.R. Commons, R.G. Tugwell.

HISTORY OF AMERICAN AGRICULTURE (second semester) Tuesdays and Thursdays, beginning January 19 at 4:50 P.M. in Room 1447-51, South Building. Instructor: Everett E. Edwards.

Second semester - A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862, agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1860 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement, rural population and tenancy charges and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

GRADUATE SEMINAR IN GENERAL ECONOMICS (second semester) Fridays, beginning January 15 at 8 P.M. in Room 2050 South Building. Instructor: Dr. Max J. Wasserman.

This Seminar is designed for mature students of Economics who may fall into one of two categories:

(1) Those students who are preparing theses for presentation for Master's or Doctor's Degrees.
(2) Students interested in the discussion of scientific economic questions.

The members of the Seminar will be divided into the following classes:

(1) Faculty consisting of instructors on the Staff of the Graduate School of the United States Department of Agriculture, Instructors of Economics on the Staffs of local Universities, and Economists occupying responsible government positions.
(2) Graduate Students.

Fee - $1.00 to be used for the purpose of covering overhead expense of conducting the course; Chairman and Faculty Members serving without pay. Seminar will meet one evening a week.

The program of each meeting will consist of the presentation of material by graduate students, papers presented by the faculty and graduate students, the reading of articles in preparation by any of the members, and the discussion of fundamental economic questions which present a theoretical interest.

Students interested in this course should obtain the permission of the Chairman before registering. The names of the members of the faculty, who will be appointed by invitation, will be announced at the first meeting of the Seminar.

CONTEMPOPARY ECONOMIC PROBLEMS (second semester) Tuesdays and Thursdays, beginning January 12 at 5 P.M. in Room 5944 South Building. Instructor: Dr. Max J. Wasserman.

This course will discuss the theoretical and practical aspects of the major economic problems confronting us at the present time. It will attempt to place each problem in its historical setting showing how it takes its roots in the past developments of economic society; to analyze the economic principles involved in the problem; to evaluate critically the various solutions proposed; and to suggest possible means of its solution. Among the problems which will be treated in the course the following may be cited:

I. Capitalism, Its Improvement and Substitute Economic Organizations.
   A. Necessary reforms in the structural organization of capitalism.
   B. Substitute forms of economic organization: Socialism, Communism, Fascism, and Syndicalism.
II. Problems of the Machine Industry.
III. Tariff in the light of international trade relations.
IV. Monetary reform, banks and the improvement of the credit system.
V. Selected Agricultural Problems:
   A. The adjustment of agricultural prices.
   B. Agricultural tenancy with special reference to sharecroppers.
   C. Problem of sub-marginal land.
   D. Conservation of natural resources.

(continued next page)

CONTEMPORARY ECONOMIC PROBLEMS - continued from page 7

VI. Selected problems in public finance.
  A. The basis of an equitable tax system.
  B. Growth of the Public debt.
  C. Form of local taxes.
VII. Control of industry and trade.
  A. The Federal Trade Commission.
  B. N.R.A.
  C. Federal incorporation.
VIII. Some problems of unemployment.
IX. Social insurance.
X. Protection of the Consumer.
XI. Future of American foreign trade.
XII. Low cost house for slum clearance.
XIII. Price behavior trends in France.
XIV. Wages and hours of work in selected industries.

WAGES AND ECONOMIC INSECURITY (second semester) Mondays and Wednesdays, beginning January 11, at 5 P.M. in Room 1618 South Building. Instructor: Prof. Edward Berman (Univ. of Illinois) W.P.A.

Wage problems and the insecurity of the worker in modern industry constitute the most important of the many labor problems. This course takes up in its study of wages the following matters: wage levels in various countries, in various industries, and for different kinds of workers; standards of living; and analysis of factors affecting particular wage levels, including an examination of older explanations and of such matters as national wealth, productivity, efficiency, and the supply of labor; wages and business cycles; wages and unemployment; the effect of labor organizations upon wages; the effect of monopoly upon wage levels; the relationship between wage problems and various kinds of legislation; the relationship between problems of relief and wages; and the wages of selected groups of workers and in selected industries. The consideration of unemployment will be devoted to a discussion of its extent; its various causes; its implications with respect to the status of labor general business developments, the functions of government, and the economic system; and various remedies suggested for unemployment, including the control of business cycles, the regulation of seasonal production, the organization of the labor market, the manner in which unemployment is affected by relief, unemployment insurance, economic planning, and a greater equalization of the distribution of wealth. Illness, especially as it affects workers, will be discussed from the point of view of the problems of industrial morbidity, the reduction of sickness hazards, and health insurance. Industrial accidents and occupational diseases will be covered from the point of view of their causes, the possibility of reducing them, and the methods of compensating workers whose income has been affected. In the discussion of old age in industry, changes in population trends, the effect of various industrial developments upon the demand for older workers, and old age pensions would be studied. The course will end with an examination of federal social security legislation.

Prerequisites: Bachelor's Degree and Principles of Economics.

POLITICAL ECONOMY AND THE LAW (year) Wednesdays and Fridays, beginning January 13, at 4:50 P.M. in Room 4756 South Building. Instructor: Joseph G. Blandi, LL.B.; Ph.D.-Johns-Hopkins; Chief, Marketing Agreements - Div. Office of Solicitor, U. S. Dept. of Agriculture.

This course will embrace a discussion of the traditional view of the isolation of the law. It will point out the gradual change in this tradition and the persistent demand for coordination of the law with economics. It will analyze the scientific status of economics, and make plain its psychological promise and the element of explanation. The meaning of property from the point of view of quality and relation will be compared and distinguished. The legal and economic theories of property, such as the occupation and labor theories as well as the Hegolian principles, the Higher Law doctrine, will be critically studied, and it will bring forth to light the functional theory - the concept of property based upon its social utility, namely, the justification and distribution of property; the influence of class bias of unemployment, wages, hours of labor, collective bargaining, industrial insurance, and social security will be taken notice of throughout this discussion. No statement will be made without its support by competent and well-recognized authorities. The views on law and economics of the Chief Justice and other eminent justices of the Supreme Court, as embodied in their opinions will constitute the mainspring of this course. Numerous Supreme Court cases and the economic aspects involved in them will be discussed and analyzed. Among the decisions of the Supreme Court will be included the most recent adjudicated cases. The course will conclude with a lecture on law and economics in the light of the Mosaic and Ancient Legislation.

The course will be conducted in an informal manner. Students will be assigned definite reading of authorities dealing with our subject. On the basis of this reading, the discussion will proceed by the members of the class led by the lecturer. The students will be required to thoroughly familiarize themselves with the contents of the United States Constitution which will permeate this course.

The following main topics will be treated:

I. Introductory Remarks

A. Maitland on the Traditional Isolation of the Law.
B. Neo-Hegelians on the Relation between the Law and Economics through Philosophy.

II. Institutions and Associations.

A. Institutions.
B. Associations.

(continued next page)

III. The Scientific Status of Economics.

A. The Laws of Economics can Be Discovered.
B. Psychological Premises.
C. The Element of Explanation.

IV. Institutions.

A. The Meaning of Property.
B. Qualities and Relation.
C. Property and Its Justification.
D. Legal and Economic Theories.

V. Associations.

A. Corporations.
B. Labor.

VI. Natural Law and Cosmic Truth.

VII. Brandeis and Holmes on Law and Economics.

A. Liberty and Profits)
B. Evasion of Taxes) Cases
C. Due Process)

VIII. The New Deal Legislation and Economics.

A. Supreme Court Decisions.
B. Lower Court Decisions.

IX. Synthesis and History.

A. Points of Contact between Law and Economics.
B. Economic Interpretation of History.
C. The Moral Interpretation of History.

X. Conclusion.

A. Law and Economics in the Light of the Mosaic and Ancient Legislation.

INTERNATIONAL TRADE (year) Tuesdays and Thursdays, beginning January 19 at 4:50 P.M. in Room 4090 South Building. Instructor: Dr. L. Volin.

The course will be devoted to the discussion of principles of international trade, the mechanism of international payments and commercial policies of the United States and selected foreign countries.

THE EVOLUTION OF ECONOMIC INSTITUTIONS (second semester) Tuesdays and Thursdays, beginning January 12 at 6 to 7 P.M. in Room 4092 South Building. Instructor: M.T. Wermel.

The fundamental Economic Institutions of Modern Capitalism, such as Private Property, the Price System, Machine Technique, and Business Enterprise, will be examined. The social relationships of men in the economic processes of production, exchange and distribution will be considered in the evolutionary process of their rise, development and decay. The economic institutions characterizing progressive historical stages of societal evolution will be analyzed and the mutability of these institutions will be emphasized.

The first semester dealt essentially with the economic institutions as we find them today and with recent attempts at institutional reconstruction. The second semester will attempt to trace the evolution of the economic arrangements as they are currently constituted from the epoch of Primitive Communism, through the periods of Patriarchal-Clan Social Organization, Ancient Slavery, Feudalism, Town Economies; Commercial Capitalism, the Epoch of Manufactures, Industrial Capitalism and Economic Imperialism.

PRINCIPLES OF ECONOMICS (second semester) Mondays and Wednesdays, beginning January 11 at 5 P.M. in Room 4613. Instructors: Dr. E. W. Braun, and M. C. Heins.

This course is designed to serve:

I. Students who wish a foundation for advanced economic theory.
II. Students who wish to link quantitative analysis with economic principles.

Emphasis will be placed upon the relation between economic principles and tendencies and frequency distributions, and time series including index numbers.

The first semester was devoted to questions relating to value. Illustrative material was drawn mainly from agricultural economics, and the second semester will be devoted to a treatment of distribution of income and other subjects, such as, money and banking, business cycles, and institutional economics, depending upon the available time and desires of the students.

ECONOMICS IN GERMAN.--Thursdays, beginning January 28 in Room 4092 South Building from 8 to 10 P.M. (Hours to be arranged after first meeting). Instructor: Dr. Walter Bauer. The first semester covered Economics in French.

This course is designed to aid Economics Majors in securing their language requirements for the Doctorate in Economics and at the same time to review in the original, contributions to economic thought. Prerequisite: Advanced or Scientific German; Bachelor's degree; Graduate program majoring in Economics.

Plan of course: The principal contributions to economic thought made by German economists will be discussed in German. Salient portions of their publications - made available in mimeographed form - will be translated and analyzed in class with a view to coining the proper English equivalents of terms and economic conceptions used by foreign economists.

STATISTICS: The sequence of courses outlined below provided a graduated series ranging from an elementary or introductory course to an advanced treatment of the mathematical and logical fcundations of statistical theory. The Mathematics courses are designed to prepare the student for the various statistical and higher mathematics courses for which they, or their equivalent, are prerequisite. In determining the adequacy of the equivalent of prerequisites for any course, the decision of the instructor of the class to which the student applies for admission will be final.

INTRODUCTION TO STATISTICAL ANALYSIS (year)
Instructors: B. R. Stauber and G. E. Ockey.

*STATISTICS 1. Offered both semesters. Fall semester meets Monday and Wednesday, beginning September 21, at 4:45 P.M., Room 2050 South Building. Spring semester meets Tuesday and Thursday beginning January 26, at 4:45 P.M. in Room 4613 South Building.

This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs, and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Prerequisite, Mathematics 1 or equivalent.

*STATISTICS 2. Offered both semesters. Fall semester meets Tuesday and Thursday, beginning September 22, at 4:45 P.M. in Room 4613 South Building. Spring semester meets Monday and Wednesday, beginning January 18 at 4:45 P.M. in Room 2050 South Building.

This will be in continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to multiple linear correlation, and an introduction to the concept of variance analysis in relation to correlation.

Prerequisite, Elementary Statistics 1, or equivalent.

STATISTICAL ANALYSIS (year)
Instructors: C. M. Purves and A. Sturges.

*STATISTICS 3. This course is offered only in the fall semester, Tuesdays and Thursdays, beginning September 22 at 4:45 P.M., and a later class at 5:45 P.M., in Room 2050 South Building.

Emphasis is placed upon sampling methods and the importance of correct sampling procedures. The methods developed by Fisher for use with small samples will be discussed at length. Time will be devoted also to sampling methods and the importance of correct sampling procedures. The graduation of both frequency series and time series will be considered.

Prerequisite, Statistics 2 and Mathematics 2 or equivalent.

*In cooperation with American University.

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*STATISTICS 4. This course is offered only in the Spring semester. Class meets Tuesday and Thursday at 4:45 P.M. in Room 2050 South Building, beginning January 12.

The various methods of correlation are applied to practical problems to bring out the proper application of correlation in statistical analysis, the limitations of correlation analysis, and the interpretation of results. Variance analysis is also applied to problems with special emphasis on the proper application of variance and its relation to correlation analysis. The principal text books used or referred to are Ezekiel's Methods of Correlation Analysis; Snedecor's Analysis of Variance and Co-Variance; Yule's Introduction to the Theory of Statistics; Fisher's Statistical Methods for Research Workers.

Prerequisite, Statistics 3 or equivalent.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year)
Instructor: Dr. W. B. Kemp (Univ. of Maryland).

STATISTICS 5. Fall semester, beginning October 12.
STATISTICS 6. Spring semester, beginning Monday, January 25, from 5 to 7 P.M. in Room 2911 South Building.

This course is intended primarily for biological workers. It consists of the theory of sampling as applied to small samples, correlation methods, and analysis of variance as applied to biological research. Text - R.A.Fisher, Statistical Methods for Research Workers (also other assignments).

Prerequisite, elementary statistical methods as given by the Graduate School or its equivalent.

ADJUSTMENT OF OBSERVATIONS (year) Given in 1936-37 and alternate years. Instructor: Dr. W. Edwards Deming.

STATISTICS 7. Fridays, beginning September 25, at 4:45 to 6:30 P.M. in Room 2050 South Building.

The course reviews the principles of summation and whatever calculus seems necessary, after which the following topics are treated: moment coefficients, theory of Sheppard's correlations for grouping, the Gamma and Beta functions. Finite differences: interpolation by differences and by Aitken's process, approximations to limits, the point binomial, the Type III curve, and the normal curve;

Prerequisite, Calculus and Statistics 4, or equivalent.

STATISTICS 8. Class begins Friday, January 22, at 4:45 to 6:30 P.M. in Room 2050 South Building.

Real sampling; the ergodic hypothesis and the specification of chance. Likelihood and the probability of causes, contrasted. Tchebycheff's inequality. Confidence intervals of Neyman and Pearson. The statistics of a single sample. History and further discussion of Bayes' rule. Two or more samples. The chi-test and the analysis of variance. Curve fitting and least squares; Doolittle's and Aitken's systems of solution. The significance of parameters estimated by least squares.

Throughout the course the history of the subject and the fundamental assumptions in the application of probability theory will be kept in evidence.

Prerequisite, fall semester. (Statistics 7 or equivalent)

*In cooperation with American University.

MATHEMATICAL PREPARATION FOR STATISTICS
Instructors: Harry J. Winslow and Forrest E. Linder

*MATHEMATICS 1. - ALGEBRA. Mondays, beginning January 25 from 4:45 to 6:30 P.M. in Room 1445 South Building.

Some time will be devoted to a review of the elementary rules of algebra. This review will be followed by topics of basic importance to the study of statistics, such as exponents, logarithms, binomial theorem, numerical approximations by means of the binomial theorem, graphs, quadratics, theory of equations, determinants, progressions, permutations and combinations.

Prerequisite, high school algebra and plane geometry.

*MATHEMATICS 2. - TRIGONOMETRY AND ANALYTIC GEOMETRY.

A continuation of Mathematics 1. This course will commence with a brief study of trigonometry and will include the distinction between identities and conditions, also some work in complex numbers, and DeMoivre's theorem. Analytic Geometry will follow and will include the straight line, conic sections, other plane curves, empirical curves and curve fitting, an introduction to three-dimensional geometry, and the graphical solution of equations.

Dr. Forrest E. Linder will continue with his class on Tuesdays in Room 1618, South Building, from 4:45 to 6:30 P.M. Mr. Harry J. Winslow will continue with his class on Fridays in Room 4092 South Building from 4:45 to 6:30 P.M.

Prerequisite, Mathematics 1, or its equivalent.

(This course or its equivalent will be a prerequisite for a course in calculus, Mathematics 3 and 4, to be offered next year, 1937-38, and in alternate years, by Dr. W. Edwards Deming.)

*BEGINNING CLASS IN - PRINCIPLES OF ACCOUNTING - Tuesdays and Thursdays opening on January 19 at 5 P.M. in Room 505 Administration Building. Instructor: Dr. Oswald Nielsen. This will be first semester work and will take up the elementary principles and procedures of accounting. The work will be carried on by discussion and problems. It is expected that at the end of this semester the student will be prepared to devise the accounting records necessary for a small business organization, make the necessary entries in the records, draw off statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books. A LABORATORY period once a week (Fridays from 5 to 7 P.M. in Room 4613 South Building), is provided at an additional cost of $5.00. An additional hour of credit will be granted to persons taking laboratory work.

*PRINCIPLES OF ACCOUNTING.--(second semester) Tuesdays and Thursdays, beginning January 19 at 5 P.M. in Room 4649 South Building. Instructor: Wm. H. Rowe. This will be a continuation of the first semester. The work during this semester will deal with more advanced principles of accounting. Subject matter to be taken up will include the determination of income under special circumstances, the valuation of assets and depreciation policies, manufacturing accounts, and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts. A LABORATORY period once a week (Fridays from 5 to 7 P.M. in Room 0051 South Building), is provided at an additional cost of $5.00. An additional hour of credit will be granted to persons taking laboratory work.

*In cooperation with American University.

PHYSIOLOGICAL CHEMISTRY (second semester).--Tuesdays and Thursdays, beginning January 19 from 8 to 9 A.M. in Room 5167 South Building. Instructor: H. O. Calvery.

The second semester will be a continuation of the first semester and will include discussions of the metabolism of the proteins, fats, and carbohydrates, as well as mineral metabolism; the chemical constituents of the urine; and finally, a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

CLIMATOLOGY (Introductory Course).--(year) Tuesdays and Thursdays, beginning January 19 at 5:15 P.M. to 6:15 P.M. in Room 1039 South Building. Instructors: Dr. Edgar W. Woolard and Jos. B. Kincer, U. S. Weather Bureau, assisted by specialists. (Second semester will begin Tuesday, October 19, 1937).

A preliminary group of lectures will present some of the fundamental principles of general descriptive and physical meteorology that are of especial importance in climatology. They will be followed by: a set of lectures on the basic principles of climatology (including climatological observations, factors which control climates, the classification of climates, etc.); a discussion of the climates of the world, with especial reference to the United States; climatological literature and its effective use; and lectures on climatic fluctuations and trends, including geological and prehistoric climates. The course will conclude with a group of lectures on the relations of climatology to other fields, especially geography, and on various applications of climatology. With the exception of the final group, the lectures will be given by various specialists of the Weather Bureau; the final lectures will be handled by specialists in other Bureaus of the Department.

GEOGRAPHY OF AGRICULTURE (second semester).--Mondays and Wednesdays, beginning January 11 at 5 P.M. in Room 4088 South Building. Instructor: Lyle Rexford Fletcher.

The second semester will be devoted to the following topics: The agricultural regions of North America. Basis of classification. Physical conditions of climate, topography and soil. Cultural patters. Relation of rural to urban population and its influence on farming. Transportation and its agricultural significance.

The eastern temperate region; the sub-tropical crops belt. The cotton belt. The mid-Atlantic trucking belt. The corn belt. The winter and spring wheat belts. The dairying region. The northern forest and hay region.

The western temperate region; the grazing and irrigated crop region. The Columbia plateau wheat region. The Pacific sub-tropical crops region. The northern Pacific hay, pasture and forest region. In each of these regions the location, extent, physical conditions, land utilization systems of farming, production, geographic factors controlling crop production and the future of farming will be emphasized. If time permits some attention will be given to the geographic relationships resulting from government policies affecting agriculture.

ADVANCED INORGANIC ANALYTICAL CHEMISTRY (second semester) Tuesdays and Thursdays, beginning January 12 at 4:45 P.M. in Room 4003. Instructor: Dr. J. I. Hoffman.

The work in the second semester will cover volumetric analysis, organic reagents used in inorganic analyses, and diagramatic outlines of procedures used in the analysis of selected materials. The evaluation of results and a discussion of probable and reasonable errors will conclude the course.

ADVANCED ORGANIC CHEMISTRY (second semester) Tuesdays and Fridays, beginning January 12, at 4:50 P.M. in Room 1137 South Building. Instructor: Dr. H. L. Haller.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins and sex hormones will be given.

Prerequisite, an elementary course in organic chemistry or its equivalent.

COMPARATIVE NEMATOLOGY (second semester) Fridays in Room 4088 South Building from 5 to 7 P.M. and laboratory on Saturdays in Room 211 East Wing, Administration Building at 1:30 P.M. Instructor: Dr. B. G. Chitwood.

The second semester will be devoted to embryology, larval development and systematic nematology. Lectures will be given on the life histories of various groups by specialists as far as is practical. The classification and systematics of the phylum will be covered in brief.

COLLOIDS (second semester) Mondays and Wednesdays, beginning January 11 at 4:50 P.M. in Room 1147 South Building. Instructor: Dr. O. A. Nelson.

Second semester -- Practical applications.

AN INTRODUCTION TO ORGANIC CHEMISTRY (second semester) Mondays and Thursdays, beginning January 11 at 4:50 P.M. in Room 1128 South Building. Instructor: Dr. E. P. Clark.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester was devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

SYSTEMATIC BOTANY (second semester) Mondays and Wednesdays, beginning January 25 at 4:50 P.M. in Room 110-West Wing, Administration Building. Instructor: Dr. S. F. Blake.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester was devoted to lectures on the general principles and classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower were studied. The principles of botanical nomenclature were discussed and some of the more important floras and monographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

SOILS: "Their Morphology, Genesis and Classification." (one semester) Mondays, Wednesdays and Fridays, beginning December 14 at 4:45 P.M. in Room 4003 South Building. Instructor: Dr. Charles E. Kellogg, Chief, Division Soil Survey. Fee - $15.00 (3 semester credits).

The course will outline the principles of soil development with examples from the United States. Students should have had the equivalent of college freshman chemistry; previous training in plant physiology, geology, geography, and logic would be helpful, but not essential. The particular material drawn from these fields would be developed in the lecture and/or in assigned readings.

In the development of the course the subject matter will be treated in the following order:

(1) Brief history of the development of soil science, especially in its relationship to agriculture.

(2) The nature of soils. A summarized discussion of the principal properties of the soil mass such as color, texture, structure, colloids, and similar fundamental characteristics. This material will be treated briefly and only those important phases will be discussed which bear directly upon the remainder of the course.

(3) The factors of soil genesis.
- (a) Parent rocks and weathering.
- (b) Influence of living matter.
- (c) Influence of climate.
- (d) Influence of relief.

(4) Determination of soil morphology and the classification of types (briefly).

(5) The processes of soil development. This section will include about half or more of the course, and the great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed. These are: Calcification, podzolization, laterization, salinization, solodization, solonization, gleization.

(6) Systems of soil classification.

(7) A few lectures at the class summarizing the whole and discussing the implications and relationships to agriculture as a whole.

A second semester of this course will be followed with seminars on land classification; depending upon the wishes of the class one or two lectures at the close will be devoted to land classification.

GLASS BLOWING (second semester) Mondays and Wednesdays, beginning January 11 at 4:50 P.M. in Basement of Smithsonian Institution. Instructor: Dr. Leland B. Clark. Fee: including materials $18.00 a semester.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" were utilized for practice, while during the second semester Pyrex and the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work. Registration is limited to ten students.

MICROSCOPIC TECHNIQUE AND HISTOLOGY (second semester) Wednesdays from 7 to 10 P.M., beginning January 13 in Room 223 East Wing, Administration Building. Instructor: Dr. Charles Wm. Rees.

This course will take up the methods of preparation and study of animal cells, tissues and organs. This study of the normal body is a preparation for a course on the pathology of protozoan and virus diseases.

The second semester will deal with the pathology of protozoan and virus diseases.

The purpose of the course is to point out selected methods of procedure for the investigation of diseases whether this is the student's principal objective or whether it arises as a complicating factor of problems having other objectives. The subjects to be studied are: (1) effects of the parasites on the hosts, (2) effects of the host on the parasites, and (3) effects of in vitro environment on micro-organisms.

The course will comprise a study of (1) the nature of the cellular response, and (2) the nature of the humoral to invasion by micro-organisms and viruses, and will include cytological and life histology studies of the common protozoan parasites.

EXTENSION SEMINARS (second semester) Instructor: M. C. Wilson. Twice per week, hour arranged to meet the convenience of the class. Toom 5534 South Building. Open to those with extension teaching experience, or with background of educational training satisfactory to the instructor. No tuition fee.

Second semester - Extension Administration and Supervision.

Principles of efficient extension administration; analyses of supervisory functions and procedures; duties of State and district supervisors of county agricultural agents and home demonstration agents; relations of State specialists and county workers. Practical study of the problems arising in the administration and supervision of extension at the college and in the field.

EXTENSION THESES -- M. C. Wilson. Room 5534 South Building. Qualified students interested in undertaking a research problem in extension education may receive credit for special problem work provided an acceptable plan is presented and the completed thesis meeting approval of a thesis committee. No tuition fee.

BEGINNING CLASS IN - ENGLISH GRAMMAR AND RHETORIC - Mondays and Wednesdays, opening on January 18 at 4:50 P.M. in Room 4092 South Building. Instructor: Dr. Homer C. House, (Head of the Department of the English Language and Literature, University of Maryland).

This course will provide a thorough review of the fundamentals of grammar and sentence structure and a careful study of English usage. Some attention is given also, to the history of form and sentence structure. Students are required to analyze sentences by diagram and to correct examples of bad English.

ELEMENTARY SCIENTIFIC FRENCH (second semester) Mondays and Wednesdays, beginning January 18 at 8 to 9 A.M., in Room 5610 South Building. Instructor: Dr. Harry B. Humphrey.

Instruction in elements of French grammar. Reading and translation of elementary articles from selected scientific texts. This course is designed to prepare beginners for the advanced course in Scientific French.

ADVANCED SCIENTIFIC FRENCH (second semester) Mondays and Wednesdays, beginning January 18 at 4:45 P.M., in Room 5610 South Building. Instructor: Dr. Harry B. Humphrey.

ELEMENTARY GERMAN (second semester) Mondays, beginning January 11 from 5 to 7 P.M., in Room 223 East Wing, Adm. Building. Instructor: Dr. C. H. Leineweber.

ADVANCED AND SCIENTIFIC GERMAN (second semester) Fridays, beginning January 15 from 5 to 7 P.M. in Room 223 East Wing, Adm. Building. Instructor: Dr. C. H. Leineweber.

ELEMENTARY RUSSIAN (second semester) Wednesdays, beginning January 13 from 5 to 7 P.M., in Room 223 East Wing, Adm. Building. Instructor: Dr. C. H. Leineweber.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Methods.

ELEMENTARY SPANISH (second semester) Mondays, beginning January 11 from 5 to 7 P.M. in Room 4616 South Building. Instructor: Miss Roberta M. Olds (Chairman, Dept. Spanish, American U.)

This course aims to secure accuracy and facility in the use of the language by means of drill in pronunciation, grammar, translations, and reading. Reading of less difficult modern prose with practice in composition, diction and conversation.

(A text containing the fundamentals of Spanish grammar will be completed. A reader with selections appropriate to Spain and Spanish-American countries will be used.)

ADVANCED SPANISH (second semester) Wednesdays, beginning January 13, from 5 to 7 P.M. in Room 4616 South Building. Instructor: Miss Roberta M.Olds.

A brief review of grammar with continued study of pronunciation and practice in oral and written composition. A study of Spain and Spanish-America through use of maps, Spanish papers, and appropriate texts. Reading of short selected works of modern authors. Dictation and conversation.

(A brief text combining grammar review and composition will be used. Suitable reading selected).

ELEMENTARY ITALIAN (second semester) Tuesdays, beginning January 19 from 7 to 9 P.M. in Room 1618 South Building. Instructor: Dr. Nicholas G. Barbella.

Proposed Outline for Lecture Course in Appreciation of Landscape Design
Beginning October 27, 1936, Ending March 2, 1937.
(Second Semester begins January 12) Room 223 East Wing, Adm. Bldg.

No. 1 - Oct. 27 - Landscape Design-Introduction-Reasons for study, the principles of design, definition of terms, the relation of the different elements of design in the development of the plan ..... Wilbur H. Simonson

2 - Oct. 29 - Types of landscape design with their adaptability to modern problems. ..... Wilbur H. Simonson

3 - Nov. 3 - The influence of national styles on landscape design and the value of the various resulting modes to modern design ..... Mr. Simonson

4 - Nov. 5 - The study of a problem. Discussion of the factors to be considered before any plan is developed... Wilbur H. Simonson

5 - Nov. 10 - Ecological factors which affect landscape design considerations ..... Wilbur H. Simonson

PRINCIPAL ELEMENTS OF LANDSCAPE DESIGN

Here will be discussed the relation of these elements to the design, the principles of their location with relation to other elements and various types of development.

6 - Nov. 12 - Service features including those for home grounds, small and large, public buildings including churches, schools, and public parks. ..... Jos. C. Gardiner

7 - Nov. 17 - Walks and drives, principles of location, types of construction and accessories as drains, gutters, etc. ..... Jos. C. Gardiner

8 - Nov. 19 - Lawns - where to locate and why including their value in landscape design. ..... F. L. Mulford

As plants are important as elements in landscape design each major class of material will be discussed as to its appropriate use, when as individuals, when as masses, when in combination. Characters of effect will be discussed, not the plants that will produce those effects.

9 - Nov. 24 - Trees. ..... Wilbur H. Simonson

10 - Dec. 1 - Shrubs. ..... Wilbur H. Simonson

11 - Dec. 3 - Vines and herbaceous plants. ..... John Paolano

(continued next page)

LANDSCAPE DESIGN--continued

DESIGNS

The landscape design elements already discussed including plant masses combined in designs for special purposes.

12 - Dec. 8 - Design of home grounds, city and suburban.... Jos. C. Gardiner

13 - Dec. 10 - Design of farmsteads of rural estates. .....

14 - Dec. 15 - Design of school and other public grounds.... Jos. C. Gardiner

15 - Jan. 7 - Design of parks. ..... M. Kirkpatrick

16 - Jan. 12 - Design of highways. ..... Wilbur H. Simonson

17 - Jan. 14 - Design of gardens. ..... John Paolano

18 - Jan. 19 - Garden accessories including steps, arbors, pergolas, terraces, seats, etc. ..... Horace W. Peaslee

19 - Jan. 21 - Water gardens, their location, development and planting. ..... Helen Fowler

20 - Jan. 26 - Rockeries as treatment of banks and other landscape features and as special gardens.... A. H. Hanson

21 - Jan. 28 - Grading and soil preparation, ... F. L. Mulford

Last date for submission of plan A. (see below)

22 - Feb. 2 - Inspection and discussion of plants submitted

23 - Feb. 4 - Plant distribution. A discussion of growing conditions in various sections of the country and of plant adaptations, native and introduced... F. L. Mulford

PLANT MATERIAL

A discussion of the character of some individual plants and how they fit into the design elements already discussed, including some lists of plants for various purposes.

24 - Feb. 9 - Deciduous trees. ..... Mr. Gordon

25 - Feb. 11 - Deciduous shrubs. ..... A. H. Hanson

26 - Feb. 16 - Coniferous evergreen trees and shrubs. ..... Mr. Gordon

27 - Feb. 18 - Broad-leaf evergreens. ..... A. H. Hanson

28 - Feb. 23 - Vines and herbaceous plants. ..... John Paolano

29 - Feb. 25 - Plant handling, planting, culture, pruning, maintaining conditions for special groups of plants. ..... A. H. Hanson

(continued next page)

LANDSCAPE DESIGN--continued

PLANT MATERIAL--continued

Date for submission of plan B to insure criticism.
Final day of submission Mon. Mar. 1.

30 - Mar. 2 - Inspection and discussion of plan B submitted.

PLANS

In addition to the lectures of this course there shall be submitted by those desiring credit, two plans, drawn to scale.

A - A plan of a problem selected by the student of a home grounds, farmstead, public or semi-public grounds, portion of a park, or other landscape feature that may be approved.

B - A detailed planting plan of the above or of an approved portion of it.

Plan A shall be submitted not later than Jan. 28. A number of these plans will be discussed in the class on Feb. 2.

Plan B shall be submitted not later than Mar. 1. If submitted by Feb. 25 there will be a better chance for its discussion on Mar. 2.

DETAILS REGARDING THE FOLLOWING THREE COURSES MAY BE OBTAINED FROM AMERICAN UNIVERSITY AFTER DECEMBER 10, 1936:

FEDERAL ACCOUNTING PROCEDURES (year) 1905 F Street, N.W.
A detailed analysis of accounting procedures as developed by the Federal Government with particular reference to the activities of the General Accounting Office. Fee $22.50.

FEDERAL REGULATION OF CORPORATE ACCOUNTING (year) 1905 F Street, N.W.
A study of the accounting problems growing out of the relationships between federal regulatory agencies and business and industry. Attention will be given to prescribed classifications of accounts by such agencies as the Interstate Commerce Commission, and the Securities and Exchange Comm. The influence of such Acts as the Internal Revenue Acts, the Securities and Exchange Acts, and the Social Securities Act upon the accounting practices of corporations will be discussed. Special cases involving major accounting principles will be analyzed. Fee $22.50.

ADMINISTRATIVE STATISTICS OF THE FEDERAL GOVERNMENT - THEIR COLLECTION AND USE IN THE FORMATION OF POLICIES (year) 1905 F Street, N.W.
Fee $22.50.

AGRICULTURAL PRICES (second semester) Mondays and Fridays, beginning January 18 at 4:50 P.M. in Room 3901 South Building. Instructor: Dr. F. L. Thomsen.

First semester.--Uses of price information. Basic concepts of demand, supply and price. Statistical measurement of changes in prices and related factors. Relation between agricultural commodity prices and the "general price level." Time elements in prices. Relation between cash and futures prices. A summary and evaluation of specific methods of price analysis and forecasting, including graphic multiple correlation and "price formations." Sources of data used in price analysis and forecasting. Outlook work.

Second semester.--Application of the foregoing principles in the analysis of specific price problems, explanation of factors responsible for specific types of price situations, proposed solutions of the "surplus problem," anticipating the effects of marketing agreements and other marketing reforms. A study of factors affecting the prices of the principal farm products, using the methods of analysis learned during the first semester.

Prospective students should have some knowledge of elementary statistics. No effort will be made to teach the details of technical statistics. The course is designed to bring the student up to date regarding the important contributions to the knowledge of agricultural prices which have been made in recent years, and not to develop expert statistical analysts.

SPECIAL TRAINING COURSES NOT FOR COLLEGE CREDIT

TECHNICAL SHORTHAND SPEED WRITING (one semester) Mondays and Wednesdays beginning January 25 at 4:45 P.M. in Room 0051 South Building. Instructor: Clara E. Richter. (Entrance speed to be 100 words per minute).

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed; in addition, supplementary relevant material will be used. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand which they write prior to entering the class. A non-technical entrance examination will be held Saturday, January 23, in Room 0051 South Building, at the rate of 100 words per minute. It is required that each student have an admission card to the examination room which can be obtained from the Graduate School, Room 4090 South Building. All admission cards must be secured prior to date of examination.

TECHNICAL SHORTHAND SPEED WRITING (one semester) Tuesdays and Thursdays, beginning January 26 at 4:45 P.M. in Room 0051 South Building. Instructor: Clara E. Richter. (Entrance speed to be 130 words per minute).

This course will be a continuation of the work of the first semester. Several additional technical vocabularies will be taken up. Conference material and a general survey of reporting technique is stressed. Range of speed anticipated is from 130 words per minute to 170 words per minute.

The course in MECHANICAL AND ARCHITECTURAL DRAWING is under consideration. Students interested should consult the Director, Dr. A. F. Woods, before January 18, 1937.

PUBLIC SPEAKING - There have been a great many requests to organize a special training course in public speaking. An effort will be made to do this if a competent instructor can be obtained, and if the number applying is sufficiently large. Further announcement will be made in the Agricultural Exchange. Those interested will kindly notify the GRADUATE SCHOOL, U.S.D.A.

A course in BASIC PHOTOGRAPHY will be offered during 1937-38.

Dr. A. F. Woods
Director, Graduate School
Room 4090 South Building
U. S. D. A.

I wish to register for the following courses:

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(Educational work completed giving schools and degrees:)

_____

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Those who cannot pay full fee in advance must register at office. Upon receipt of fee, registration cards will be mailed.

Present position - Civil Service Status:

_____

Official Address_____ Telephone_____.
(Where employed) _____.

I will call at your office and complete registration_____.

Name_____

Home Address_____ Telephone_____

I enclose check or money order for:_____

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AGRICULTURAL EXTENSION
U.S. DEPARTMENT OF AGRICULTURE

RETIREMENT: Beginning Thursday, May 13, Mr. Ulrey J. Biller, Fifth Vice-President of the National Federation of Federal Employees, will conduct a short course of study of the retirement law. Tuition free.

The object will be to give an understanding of the details of the present legislation, with special reference to how it applies practically and to possible changes in the law.

The course is open to all members of the Department of Agriculture who wish to enroll, up to a maximum of 200. It will be given on five (5) successive Thursdays - May 13, 20, 27, June 3 and 10, from 4:50 to 5:50 P.M. in the Auditorium of the South Building. Register at room 4090.

Mr. Biller is a master of the subject of retirement and had much to do with obtaining the present law. No one is better qualified to illuminate its provisions as they affect the employees of the Department. (Mr. Herbert A. Smith, Chairman).

O V E R

U S D A GRADUATE SCHOOL U S D A
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INSURANCE: The Graduate School has under consideration a series of two lectures on Insurance by Dr. Alfred Manes, formerly of the University of Berlin and now visiting professor of Insurance at Indiana University. One lecture might possibly deal with the evolution of different forms of insurance and extent of their use throughout the world, and the other might deal with the theory and practice of insurance. Opportunity will be available for conferences. If you would be interested in two such lectures at a combined cost of one dollar ($1.00), please notify the Graduate School Office, Room 4090, telephone Br.317.

This is merely an inquiry to determine whether there is sufficient demand for such lectures to justify making of arrangements.

O V E R

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U.S. DEPARTMENT OF AGRICULTURE

DR. J. NEYMAN TO LECTURE APRIL 7-10

One of the world's leading statisticians has been engaged by the Graduate School to lecture in the Department of Agriculture auditorium April 7th, 8th, and 9th -- Dr. J. Neyman of the University of London. His contributions in the subjects of the first two lectures (see below) are his best known works, and the breadth of his interests insures all research workers a profitable attendance.

Wednesday, April 7th, 4:45 p.m. The object of statistical methods.

Thursday, April 8th, 4:45 p.m. Rational principles for selecting tests.

Friday, April 9th, 4:45 p.m. The theory and practice of sampling human populations.

OVER

USDA GRADUATE SCHOOL USDA
FLIER

Each lecture will be followed by extempore questions and discussions. Tickets $1.50 for the three lectures.

In addition to the lectures, conferences are being planned with Dr. Neyman to afford the opportunity of studying in greater detail a number of special problems in statistics in which members of the Department have expressed an interest.

Information can be obtained from Messrs. B. R. Stauber, B.A.E. Room 2620, South Building, or W. Edwards Deming, B.C. & S.

OVER

FEB 23 1938

U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
1937-38

The general circular of information relative to courses of instruction available in the Graduate School of the U. S. Department of Agriculture for year beginning September 20, 1937, may be obtained by sending name and address to Eva M. Johnson, Secretary, Graduate School, 4090 South Building, U. S. Department of Agriculture. The following courses are included:

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BUREAU OF
AGRICULTURAL ECONOMICS
U. S. DEPARTMENT OF AGRICULTURE

Accounting: Elementary and Advanced
Administrative Law
Agricultural Prices
History of American Agriculture
Geography of Agriculture
Mathematical Preparation for Statistics:
Algebra
Trigonometry and Analytic Geometry
Mathematical Analysis
Calculus
Adjustment of Observations
Interpolation and Finite Differences (ONE MONTH INTENSIVE COURSE BEGINNING AUGUST 30th)
Elementary Statistical Analysis
Advanced Statistical Analysis
Statistics - Seminar
Statistical Theory and Method in Geographical Research
Principles of Economics
History of Economic Thought
Money and Banking
Contemporary Economic Problems
A Comparative Study of Current Economic Systems
Trade Unionism
Labor Law
Federal Jurisdiction and Procedure
Economics in French and German
The History of Social Thought and Theory
Rural Sociology
Political Economy and the Law
Economics of Instability
Lectures on Administrative Management (10 in all)
Extension Seminars
Extension Theses
Effective Speech
Plant Ecology
The Principles of Animal Pathology
Systematic Botany
Plant Breeding with Special Reference to Disease Resistance
An Introduction to Organic Chemistry
Advanced Inorganic Analytical Chemistry
Physiological Chemistry
Advanced Organic Chemistry
Soils: "Their Morphology, Genesis and Classification"

Glass Blowing (limited to 10 students)
Determinative Minerology
Climatology
Survey of Public Personnel Management
Management and Supervision
Architectural Drawing
Freehand Drawing
Mechanical Drawing
Blueprint Reading
Descriptive English Grammar
The Poetry of Robert Browning
Editing Manuscripts
Coaching Class in English and Letter Writing
Shorthand - Technical Speed Writing
German - Elementary, Advanced and Scientific
Russian- Elementary, Advanced and Scientific
Spanish- Elementary and Advanced
Italian- Elementary and Advanced
Comparative Nematology
Basic Photography

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

A. F. Woods.

A. F. Woods
Director, Graduate School

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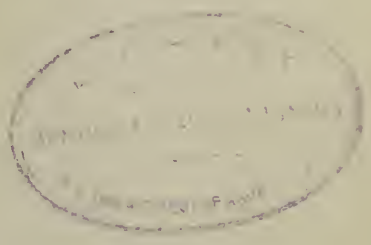
UNITED STATES

DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL



MAKING AVAILABLE FACILITIES
For
STUDY AND RESEARCH

FOR THE YEAR 1937 - 1938

Washington, D. C.

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

EDUCATIONAL COURSES - 1937-38

Beginning September 20, 1937

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The Graduate School of the United States Department of Agriculture will open the 1937-38 school year the week beginning September 20. Classes will meet in the Department buildings at 4:45 P.M. or as soon thereafter as the students assemble. The tuition will be $12.00 a semester for two hour a week studies and $15.00 a semester for three hour a week studies, except as otherwise indicated. Registration fee for classes discontinued on account of small registration will be returned. Students withdrawing from classes having 15 or less will not be entitled to refund. A $3.00 registration fee is retained in case of withdrawal from continued classes. Cash refunds will not be made after the second week.

REGISTER IN ADVANCE. No one will be admitted to class without a registration card.

The Congress of the United States has made special provision for making the facilities for study and research in the Government Departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe. Joint Res. April 12, 1892 (27 Stat. 395); Deficiency Act of March 3, 1901 (31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act establishing the Department a School of Graduate Studies was organized with the approval of the Secretary of Agriculture in 1921 for the benefit of Department employees and such others as are qualified to undertake the work offered.

The work is organized on a standard college basis and certificates of credit for the work accomplished are issued on a standard unit basis. This work has been accepted by graduate schools and accredited colleges and universities wherever it fits in to the approved program of the students. Certain courses as indicated are conducted in cooperation with the School of Public Affairs of American University, indicated by *.

The plan provides first for work by graduate or advanced students by special arrangement through the graduate schools of accredited colleges with the Graduate School of the Department of Agriculture for the utilization of the available facilities of Government laboratories and collections, in the study of an approved problem under the general supervision of a qualified government specialist.

The second type of work is formal class and laboratory work conducted after 4:30 P.M. or 1 P.M. Saturdays in such subjects as may be helpful to government workers. Everything necessary is done to insure the highest standard of work so that it may be satisfactory to the Government and cooperating colleges.

The Graduate School certifies credits earned. Acceptance, of course, depends on the rules of the college to which the credits are presented. The instructors are.

selected from the best qualified members of the scientific and professional staffs of the various Bureaus and nearby cooperating colleges. They are, of course, mostly in the Civil Service and hold their positions by reason of merit. They compare favorably with the staffs of the leading colleges and universities from which most of them are originally drawn.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is fifteen, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

Special series of lectures not included in this preliminary statement will be announced from time to time as plans for them are completed.

The latest catalogues of universities and colleges are available for consultation in the Office of the Director, Room 4090, South Building.

Inquires regarding the school should be addressed to:

A. F. Woods
Director, Graduate School
U. S. Department of Agriculture
4090 South Building.

ROOM ASSIGNMENTS FOR CLASSES MAY BE OBTAINED FROM THE DIRECTOR'S OFFICE.

STUDENTS REGISTERING IN THE GRADUATE SCHOOL FOR CREDIT IN AMERICAN UNIVERSITY IN THE CASE OF COOPERATIVE COURSES WILL BE CHARGED $7.50 A CREDIT HOUR, UNLESS OTHERWISE STATED.

INDEX OF COURSES

	Page
Accounting -	
Principles of (Beginning Class)	5
Principles of (Second Semester's Work)	5
Second Year Accounting	5
Cost Accounting	5
Administrative Law	6
Administrative Management - Lectures	26
Agriculture, Geography of	11
Agriculture, History of American	9
Agricultural Prices	6
Animal Pathlogy; Principles of	21
Botany, Systematic	21
Chemistry -	
An Introduction to Organic Chemistry	19
Advanced Organic Chemistry	19
Advanced Inorganic Analytical Chemistry	18
Physiological Chemistry	22
Climatology	22
Conservation of Health - Lectures	27
Determinative Mineralogy	20
Economics -	
A Comparative Study of Current Economic Systems	10
Contemporary Economic Problems	8
Economics in French and German	8
Economics of Instability	9
History of Economic Thought	7
Money and Banking	7
Principles of Economics	7
Wages and Economic Insecurity	10
Ecology, Plant	20
Editing Manuscripts on Agriculture, Home Making and Related Subjects	22
Extension Seminars	12
Extension Theses	12
Federal Jurisdiction and Procedure	6
Glass Blowing	20
Government Correspondence	23
Graphic Presentation -	
Architectural Drawing	25
Blueprint Reading	25
Freehand Drawing	25
Mechanical Drawing	25
Labor Law	10
Languages -	
Descriptive English Grammar	23
French	23
German	23
Italian	24
Russian	23
Spanish	24

INDEX OF COURSES

	Page
Management and Supervision	27
Mathematics -	
Algebra	13
Trigonometry and Analytic Geometry	13
Calculus	13-14
Mathematical Analysis	14
Interpolation and Finite Differences	14
Plant Breeding with Special Reference to Disease Resistance	21
Plant Diseases with Speical Reference to Cause and Control	20
Photography, Basic	26
Poetry of Robert Browning	23
Political Economy and the Law	11
Practical Public Speaking	26
Public Personnel Management, Survey of	27
Rural Sociology	12
Shorthand, Technical Speed Writing	24
Social Thought and Theory, History of	12
Soils: Their Morphology, Genesis and Classification	19
Statistics -	
Special Notice	15
Elementary	15-16
Advanced	16
Advanced Course for Biological Workers	16
Adjustment of Observations	16-17
Multivariate Analysis	17
Statistics Seminar	18
Statistical Theory and Method in Geographical Research	18
Trade Unionism	10
Registration Letter	28

PRINCIPLES OF ACCOUNTING* (year) One section Mondays and Wednesdays, beginning September 27 at 5 P.M., and another section Tuesdays and Thursdays, beginning September 28 at 5 P.M. Instructors: Dr. Oswald Nielsen, R.I. Robinson and Wm. H. Rowe.

First semester.--During the first semester the elementary principles and procedures of accounting will be taken up. The work will be carried on by discussion and problems. It is expected that at the end of the semester the student will be prepared to devise the accounting records necessary for a small business organization, make the necessary entries in the records, draw off statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester.--The work during the second semester will deal with more advanced principals of accounting. Subject matter to be taken up will include the determination of income under special circumstances, the valuation of assets and depreciation policies, manufacturing accounts, partnership accounts, and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

A two hour LABORATORY PERIOD once a week is required for students taking course for credit unless specially excused by the instructor in which event two hours credit will be given for the course. Instructor: Geo. Y. Jarvis.

PRINCIPLES OF ACCOUNTING* (second semester's work) If there are a sufficient number of applicants to form a class in the fall semester, special arrangements will be made to give the second semester of this course beginning September 28 - Tuesdays and Thursdays at 5 P.M. Instructor: Wm. H. Rowe.

SECOND YEAR ACCOUNTING* (year) Thursdays, beginning September 23 from 5:00 to 7:30 P.M. in Room 22, 1903 F Street, N. W. Fee $22.50. Instructor: Dr. Oswald Nielsen.

First semester.--This course will deal largely with valuation. It will include the principles governing the valuation of various types of assets, suitable methods of reflecting asset values in the accounts, fundamentals of determining the liabilities and net worth, and the allocation of income and expense to the proper fiscal period as part of the problem of valuation. The discussion of profits will include a consideration of the problems pertaining to the deferring of expenses and the treatment of unusual losses and gains. The appropriation of profits for dividends and reserves and the relationship of funds to reserves will also be examined. Prerequisite: First year of Accounting, or its equivalent.

Second semester.--Content of course to be announced in January bulletin.

COST ACCOUNTING.*--This course will be offered in the fall semester if sufficient number of students indicate intention to register for the course. Special announcement will be available later.

* In cooperation with American University.

ADMINISTRATIVE LAW*(year) - An advanced graduate course in Administrative Law will be available through American University. Fee $30.00 - 3 semester hours credit. Instructor: A. S. Flemming, Directr, School of Public Affairs, American University.

FEDERAL JURISDICTION AND PROCEDURE (one semester) Mondays and Wednesdays, beginning September 27 at 4:45 P.M. Instructor: Elmer D. Hays, A.B. and LL.B.

This course will deal with the original and limitations of the jurisdiction of the federal courts; their constitutional and statutory authority and their function in interpreting and developing the constitution, treatise and laws of the United States. In broad outline, the subject matter to be covered by these lectures will be as follows:

(1) The origin and limits of the jurisdiction of the federal courts.
(2) The Supreme Court and its jurisdiction.
(3) History and origin of inferior federal courts.
(4) Civil controversies over which the federal courts have exclusive jurisdiction.
(5) Cases arising under the constitution.
(6) Removal of cases from state to federal courts.
(7) Habeas corpus.
(8) Appelate jurisdiction of the federal courts.

AGRICULTURAL PRICES (year) Mondays and Fridays, beginning September 20 at 4:50 P.M. Instructor: Dr. F. L. Thomsen.

First semester.--Uses of price information. Basic concepts of demand, supply and price. Statistical measurement of changes in prices and related factors. Relation between agricultural commodity prices and the "general price level." Time elements in prices. Relation between cash and futures prices. A summary and evaluation of specific methods of price analysis and forecasting, including graphic multiple correlation and "price formations." Sources of data used in price analysis and forecasting. Outlook work.

Second semester.--Application of the foregoing principles in the analysis of specific price problems, explanation of factors responsible for specific types of price situations, proposed solutions of the "surplus problem," anticipating the effects of marketing agreements and other marketing reforms. A study of factors affecting the prices of the principal farm products, using the methods of analysis learned during the first semester.

Prospective students should have some knowledge of elementary statistics. No effort will be made to teach the details of technical statistics. The course is designed to bring the student up to date regarding the important contributions to the knowledge of agricultural prices which have been made in recent years, and not to develop expert statistical analysts.

* In cooperation with American University.

PRINCIPLES OF ECONOMICS (year) Mondays and Wednesdays, beginning September 20 at 5 P.M. Instructor: Dr. E. W. Braun.

This course is designed to serve:

I. Students who wish a foundation for advanced economic theory.
II. Students who wish to link quantitative analysis with economic principles.

Emphasis will be placed upon the relation between economic principles and tendencies and frequency distributions, and time series including index numbers.

The first semester will be devoted to questions relating to value. Illustrative material will be drawn mainly from agricultural economics, and the second semester will be devoted to a treatment of distribution of income and other subjects such as money and banking, business cycles, and institutional economics, depending upon the available time and desires of the students.

A three hour course from 5 to 7:30 P.M., one night a week, is available at American University.

HISTORY OF ECONOMIC THOUGHT (year) Mondays and Wednesdays, beginning September 20 at 5 P.M. Instructor: Dr. Max J. Wasserman.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresmo. The Merchantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Rivere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill: The Socialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Kneis, Hillebrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics -- Veblen, Pigou, J. M. Clark, J. R. Commons, R. G. Tugwell.

MONEY AND BANKING (year) Fridays, beginning September 24 from 7 to 9 P.M. Instructor: Dr. Max J. Wasserman.

This course will treat the following subjects:

Money: Medium of Exchange, Functions of Money, History of the United States Coinage, Paper Money, The Money System of the United States, Value of Money and Prices, Credit.

Banking: Origin and development of Banking, Banking Development in the United States, Functions of the Bank, National Banking System, Administration, Deposits and Depositors, Clearing House, Domestic and Foreign Exchange, Loans and Discounts, Bank Supervision, Savings Banks, Trust Companys, Foreign Banking Systems, Defects of National Banking Systems, Federal Reserve System.

CONTEMPORARY ECONOMIC PROBLEMS (year) Tuesdays and Thursdays beginning September 21 at 5:00 P.M., Instructor: Dr. Max J. Wasserman.

This course will discuss the theoretical and practical aspects of the major economic problems confronting us at the present time. It will attempt to place each problem in its historical setting showing how it takes its roots in the past developments of economic society; to analyze the economic principles involved in the problem; to evaluate critically the various solutions proposed; and to suggest possible means of its solution. Among the problems which will be treated in the course the following may be cited:

I. Capitalism, Its Improvement and Substitute Economic Organizations.
   A. Necessary reforms in the structural organization of capitalism.
   B. Substitute forms of economic organization: Socialism, Communism, Fascism, and Syndicalism.
II. Problems of the Machine Industry.
III. Tariff in the light of international trade relations.
IV. Monetary reform, banks and the improvement of the credit system.
V. Selected Agricultural Problems:
   A. The adjustment of agricultural prices.
   B. Agricultural tenancy with special reference to sharecroppers.
   C. Problem of sub-marginal land.
   D. Conservation of natural resources.
VI. Selected problems in public finance.
   A. The basis of an equitable tax system.
   B. Growth of the Public debt.
   C. Form of local taxes.
VII. Control of industry and trade.
   A. The Federal Trade Commission.
   B. N.R.A.
   C. Federal incorporation.
VIII. Some problems of unemployment.
IX. Social insurance.
X. Protection of the consumer.
XI. Future of American foreign trade.
XII. Low cost housing for slum clearance.
XIII. Price behavior trends in France
XIV. Wages and hours of work in selected industries.

ECONOMICS IN FRENCH AND GERMAN (year) Thursdays beginning September 30, at 4:45 to 6:30 P.M. Instructor: Dr. Walter Bauer.

Designed to aid Economics Majors in securing their language requirements for the Doctorate in Economics; to review in the original, contributions to economic thought. Prerequisites: Advanced or Scientific French and German. Bachelor's Degree. Graduate program majoring in Economics.

Plan of Course: The principal contributions to economic thought made by German and French economists will be discussed in German and French. Salient portions of their publications - made available in mimeographed form - will be translated and analyzed in class with a view to coining the proper English equivalents of terms and economic conceptions used by foreign economists.

HISTORY OF AMERICAN AGRICULTURE (year) Tuesdays and Thursdays, beginning September 21 at 4:50 P.M. Instructor: Mr. Everett E. Edwards.

First semester.--A consideration of the following topics: Introduction; geographic factors; settlement of the English colonies along the Atlantic Coast; indigenous and foreign contributions to American agriculture; Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; agriculture in the English colonies; trade and markets in the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political activity to the American Civil War; agriculture's relation to the sectional struggle. No prerequisites.

Second semester.--A consideration of the following topics: Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, i.e., agricultural leaders, agricultural societies, agricultural fairs, agricultural education, State and Federal departments; agriculture since about 1860 by regions and commodities; farmers and political activity since the political revolution of 1860; American agriculture during the World War; the cooperative movement, rural population and tenancy changes and tendencies; the agricultural problem of the last decade, analyses, and proposed solutions.

ECONOMICS OF INSTABILITY (one semester) Mondays and Wednesdays, beginning September 20 at 4:45 P.M. in Room 201 Administration Building. Instructors: Dr. Mordecai Ezekiel and Dr. Louis H. Bean.

1. A consideration of the types of instability present in the economic system as a whole, including both business cycles, major depressions, and cycles of individual industries.

2. A critical examination of the law of supply and demand with reference to the development of the theory of economic cycles under the normal operation of that law and with the expected behavior of industries of various production response and various types of business organization, and a comparison of this theoretical examination with previous economic theory.

3. An examination of a number of industries with reference to the existence of continuous instability or cycles in the various industries in the light of the theoretical principles developed, including agricultural industries such as hogs, cattle, sheep, and cotton, and non-agricultural industries such as ship-building, automobiles, house construction, steel, etc.

4. A consideration of general instability in the economic structure, including financial policy, savings, and changes in the proportion of wage earnings to profits and dividends.

5. A consideration of cycles or instability in industry as a whole in relation to instability in various individual industries and to general causes of economic instability.

Prerequisite: An M.A. degree in economics plus statistics and courses in statistical price analysis.

WAGES AND ECONOMIC INSECURITY - will be available again in 1938-39.

A COMPARATIVE STUDY OF CURRENT ECONOMIC SYSTEMS(year) Mondays beginning September 28 from 7:30 to 9:30 P.M. Instructor: Mr. Edward Berman.

Alternatives to the present economic system. This course will cover the following points: An analysis of the fundamental aspects of the present economic system; criticisms of that system by Socialists and Fascists; the study of the early Utopian Systems; Karl Marx and his economic ideas; Revisionary Socialism; Anarchism; Syndicalism; Guild Socialism, Communism and the Russian Revolution; the development of Socialism in Russia; Fascism and its development in Italy, Germany and other countries; the planning of a Socialist Society; the operations of Fascist Societies; cooperation as an alternative to the existing system.

TRADE UNIONISM (one semester) Mondays and Wednesdays, beginning September 28 at 5:00 P.M. Instructor: Edward Berman.

This course will study the development, the principles and the economic implications of trade unionism. It will take up the types of unions; the history of the American Labor Movement; the principles of collective bargaining; trade agreements; strikes; boycotts; picketing; violence in labor disputes; the attitudes of the courts toward union activities; anti-union contracts; the use of injunctions in labor disputes and methods of settling disputes.

A considerable share of the time available will be devoted to important recent developments including the growth of the C.I.O.; the organization of unskilled workers; sit-down strikes; the effects of the Norris-LaGuardia Act; the Wagner Labor Relations Act; the relations of labor to politics; the organization of government employees; and the organization of relief workers.

LABOR LAW (to be given during the second semester - January, 1938) Mondays and Wednesdays at 5:00 P.M. Instructor: Mr. Edward Berman.

This course will be devoted to a study of labor law both as it relates to the activities of trade unions and as it affects the constitutionality of labor legislation. The following subjects will be given attention: the doctrine of conspiracy; the principles of constitutional interpretation; the legality of strikes, boycotts and picketing; injunctions; anti-union contracts; the settlement of labor disputes; child labor laws; laws limiting hours of labor, especially for women; employers' liability; workmen's compensation; laws regulating convict labor; minimum wage laws, and the labor legislation of the New Deal.

Particular attention will be given to certain important recent developments including the Wagner Labor Relations Act and its effect; the Social Security legislation; the decisions affecting minimum wage laws; railroad retirement legislation; and the controversy over the Supreme Court.

POLITICAL ECONOMY AND THE LAW (year) Wednesdays and Fridays, beginning September 20 at 4:50 P.M. Instructor: Joseph G. Blandi, LL.B.; Ph.D.-Johns-Hopkins.

This course will embrace a discussion of the traditional view of the isolation of the law. It will point out the gradual change in this tradition and the persistent demand for coordination of the law with economics. It will analyze the scientific status of economics, and make plain its psychological promise and the element of explanation. The meaning of property from the point of view of quality and relation will be compared and distinguished. The legal and economic theories of property, such as the occupation and labor theories as well as the Hegolian principles, the Higher Law doctrine, will be critically studied, and it will bring forth to light the functional theory - the concept of property based upon its social utility, namely, the justification and distribution of property; the influence of class bias of unemployment, wages, hours of labor, collective bargaining, industrial insurance, and social security will be taken notice of throughout this discussion. No statement will be made without its support by competent and well-recognized authorities. The views on law and economics of the Chief Justice and other eminent justices of the Supreme Court, as embodied in their opinions will constitute the mainspring of this course. Numerous Supreme Court cases and the economic aspects involved in them will be discussed and analyzed. Among the decisions of the Supreme Court will be included the most recent adjudicated cases. The course will conclude with a lecture on law and economics in the light of the Mosaic and Ancient Legislation.

The course will be conducted in an informal manner. Students will be assigned definite reading of authorities dealing with our subject. On the basis of this reading, the discussion will proceed by the members of the class led by the lecturer. The students will be required to thoroughly familiarize themselves with the contents of the United States Constitution which will permeate this course.

GEOGRAPHY OF AGRICULTURE (year) Tuesdays and Thursdays, beginning September 21 at 4:50 P.M. Instructor: Lyle Rexford Fletcher, (Div. of Geography, Bureau of the Census).

A survey course in the Geography of Agriculture in the United States. The first semester will be devoted to a consideration of those geographic fundamentals that directly affect agricultural production in the U. S. Toward the close of the semester, the subject of regional distribution of agriculture will be studied with emphasis on the Pacific coast region.

The second semester will commence with a continuation of the discussion of the various agricultural regions of the U. S. touching upon the Rocky mountain, Great Plains, Mississippi Valley, Southern and Atlantic States and New England. Term reports on various major agricultural crops will be required and at the close of the semester the crops covered by these reports will be studied with reference to production, distribution and consumption, governmental policies affecting them and a survey of the possible future trends in production.

THE HISTORY OF SOCIAL THOUGHT AND THEORY (one semester) Tuesdays and Thursdays, beginning September 28 at 4:50 P.M. Instructors: Dr. Carl C. Taylor and Dr. C. P. Loomis.

This is a course in advanced sociology in which is considered the history of social philosophy, the history of social theories, and the historical and cultural foundations of modern society. Especial attention will be given to the influence which geographic, ethnic, biological, and economic factors have had on the evolution of historical and modern theories, and the part idealogies have had in shaping human institutions will be treated.

Prerequisites: at least six semesters in social science - sociology, economics, history, or political science - two of which must have been sociology.

RURAL SOCIOLOGY (one semester) Mondays and Wednesdays, beginning September 27 at 4:50 P.M. Instructors: Dr. Carl C. Taylor and Dr. C. P. Loomis.

This course will cover a general survey of outstanding rural social problems in the United States and make comparisons between urban and rural societies; between American and European rural life; and between primitive or simpler societies and modern society. Outstanding topics for discussion and assigned reading will be: Urban and Rural Differences, Population Composition and Migrations, Rural Community Structure and Organization, Economic and Social Status of Farm Classes, Farmers' Organizations; and the Rural Standard of Living.

Prerequisites: one semester course in sociology and three additional semester courses in sociology and economics, i.e. four semester courses in sociology and economics, one at least of which must have been in sociology.

EXTENSION SEMINARS (year) Instructor: M. C. Wilson, Twice per week, hour arranged to meet the convenience of class. Room 5534 South Building. Open to those with extension teaching experience, or with background of educational training satisfactory to instructor. No tuition fee.

First semester.--Extension Methods.--Ways of measuring extension progress; the influence of such factors as size of farms, land tenure, educational training, age, and contact with extension workers upon effectiveness of extension teaching.

The various means and agencies employed in extension teaching as: result demonstrations, method demonstrations, meetings, news articles, personal service, bulletins, exhibits, circular letters, extension schools, and radio, will be carefully analyzed from the standpoint of their teaching function; adaptability to different subject matter, relative influence, relative cost, and interrelationship.

Second semester.--Extension Administration and Supervision.--

Principles of efficient extension administration; analyses of supervisory functions and procedures; duties of State and district supervisors of county agricultural agents and home demonstration agents; relations of State specialists and county workers. Practical study of the problems arising in the administration and supervision of extension at the college and in the field.

EXTENSION THESES.--M.C. Wilson. Room 5534 South Building. Qualified students interested in undertaking a research problem in extension education may receive credit for special problem work provided an acceptable plan is presented and the completed thesis meeting approval of a thesis committee. No tuition fee.

MATHEMATICAL PREPARATION FOR STATISTICS

Students who are in doubt about the adequacy of their preparation, and any others who wish advice in the selection of mathematics courses, will find Dr. Deming in the office of the Graduate School, Room 4090 South Building, for consultation from 4 to 5 P.M. on September 23d, 24th, 27th, 29th, and October 1st.

MATHEMATICS 1* - ALGEBRA. One section meeting Mondays and Fridays, beginning September 27th, from 4:40 to 5:40 P.M. Instructor: Mr. Harry J. Winslow. Another section will meet Tuesdays and Thursdays, beginning September 28th from 4:40 to 5:40 P.M. Instructor: Dr. Forrest E. Linder.

The fundamental rules of algebra; exponents; logarithms; proportion; composition and division of proportions; identities and conditions; solution of equations; binomial theorem, numerical approximations; use of summation sign and other symbols of algebra; determinants, calculation and use of reciprocal determinants, theory of equations; progressions; series; permutations and combinations. Graphical methods will be illustrated throughout the course.

Prerequisite: high school algebra and plane trigonometry.

(Course 1 will be offered during the second semester also, to be given if the registration is sufficient.)

MATHEMATICS 2* - TRIGONOMETRY AND ANALYTIC GEOMETRY. Offered the second semester only.

This is a continuation of course 1. The work in trigonometry will include a study of similitude of figures in Euclidean geometry; definitions of trigonometric functions; identities; complex numbers, DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves; polar coordinates; families of curves, one or more parameters, parametric equations of curves; radical axis; graphical solution of equations. Introduction of three-dimensional geometry.

Prerequisite: Mathematics 1 or its equivalent.

MATHEMATICS 3 - CALCULUS. Mondays and Wednesdays beginning September 27th, from 4:50 to 5:50 P.M. Instructor: Dr. W. Edwards Deming and assistant. Text: Woods and Bailey, Elementary Calculus.

Rate of change, speed and acceleration; tangents to curves; derivatives; differentials and approximations, derivatives of higher order; the notion of a function. Differentiation of a polynomial. Integration, a limiting summation. Problems involving maxima and minima; implicit functions. Differentiation and integration of transcendental functions. Analytic geometry and algebra will be reviewed as needed. Applications.

Prerequisite: Courses 1 and 2 or their equivalent.

* In cooperation with American University.

MATHEMATICS 4 - CALCULUS. - A continuation of course 3.

Calculus in polar and other coordinates; total and partial derivatives; Taylor's series in several variables, expansion of functions. Limits and convergence. Integration of more complicated expressions. Repeated integrals; use of tables of integrals. Applications to physics and statistics.

Prerequisite: The first semester or its equivalent.

MATHEMATICS 5 - MATHEMATICAL ANALYSIS. - Tuesdays and Thursdays, beginning September 28th, from 4:40 to 5:40 P.M. Instructor: Mr. Albert Wertheimer.

Emphasis will be placed on topics useful in mathematical statistics. Brief review of the fundamentals of calculus. Plane curves; parametric equations; families of curves; envelopes, order of contact of two curves. Differentiation of integrals; change of variable; line integrals, variations. The Gamma function, and other functions defined by integrals. Approximate evaluation of definite integrals; Euler summation formula. The use of function scales in the manipulation of empirical formuals for finding derivatives.

Prerequisite: Calculus.

MATHEMATICS 6 - MATHEMATICAL ANALYSIS. - A continuation of the preceding course. The study of surfaces, tangent planes and normals. The Jacobian. Reciprocal determinants. Quadratic surfaces, ruled surfaces. Surface and volume integrals, multiple integrals and change of variables. Taylor's series in several variables; the propagation of error. Fourier series. Introduction to vector notation; matrix notation; application to tangent planes and normals. Geometry in higher dimensions. Discussion of linear equations, indeterminancy, near-indeterminacy, and collinearity.

Prerequisite: The first semester.

NOTE: (The time of meeting for MATHEMATICS 5 and 6 may possibly be changed to an evening hour. Prospective students should express preference in writing to the Secretary of the Graduate School, or by consulting Dr. Deming during the hours mentioned after heading of "Mathematics.")

MATHEMATICS 7 - INTERPOLATION AND FINITE DIFFERENCES

An intensive short course, giving one hour credit; fee $5.00. Mondays and Wednesdays commencing August 30th and ending September 29th; 4:40 to 6:00 P.M. Instructor: Dr. W. Edwards Deming.

Weierstrass' theorems. Divided differences; Newton's general formula. Aitken's processes. The Euler-Maclaurin summation; numerical evaluation of definite integrals by Aitken's linear process. Waring's (Lagrange's) formula. Equally spaced arguments; tabular differences. Construction of tables. The Gregory-Newton formulas; symbolic expressions. Taylor's series as a limit; Newton's approach to the infinitesimal calculus; expansion of functions. Factorial coefficients; expansion of a power of x. Differences in terms of derivatives; derivatives in terms of differences. Differences in subdivided intervals. Central difference formulas; Sheppard's notation. Relative accuracy.

MATHEMATICS 7 - continued
Inverse interpolation by differences. Reciprocal differences. Machine methods will be developed for all procedures.

Prerequisite: College algebra, analytic geometry.
(To be offered again in September 1938)

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For other courses in mathematics see also the listing under statistics courses, on the pages immediately following.

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STATISTICS

SPECIAL NOTICE:

In connection with the studies in mathematics and statistics, it should be mentioned that it is the plan of the Graduate School to bring to Washington annually one or two of the leaders in statistical thought for short courses of lectures and conferences. During the past year Professor R. A. Fisher and Dr. J. Neyman, both of London, have been brought here. Efforts are now under way to secure Dr. Walter Shewhart of the Bell Telephone Laboratories at some time during the coming academic year for a series of four lectures with informal seminars.

STATISTICS: The sequence of courses outlined below provide a graduated series ranging from an elementary or introductory course to an advanced treatment of the mathematical and logical foundations of statistical theory. The mathematics courses are designed to prepare the student for the various statistical and higher mathematics courses for which they, or their equivalent, are prerequisite. In determining the adequacy of the equivalent of prerequisites for any course, the decision of the instructor of the class to which the student applies for admission will be final.

INTRODUCTION TO STATISTICAL ANALYSIS (year)
Instructors: B.R.Stauber and G.E.Ockey

STATISTICS 1*-Offered both semesters. Fall semester meets Mondays and Wednesdays, beginning September 20, at 4:45 P.M. Spring semester meets Tuesdays and Thursdays beginning January 25, at 4:45 P.M.

This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs, and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Prerequisite: Mathematics 1 or equivalent.

* In cooperation with American University.

STATISTICS - continued

STATISTICS 2* - Offered both semesters. Fall semester meets Tuesdays and Thursdays, beginning September 21 at 4:45 P.M. Spring semester meets Mondays and Wednesdays, beginning January 17 at 4:45 P. M.

This will be in continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to multiple linear correlation, and an introduction to the concept of variance analysis in relation to correlation.

Prerequisite: Elementary statistics 1, or equivalent.

STATISTICAL ANALYSIS (year)
Instructors: C.M. Purves and A. Sturges

STATISTICS 3* - This course is offered only in the fall semester, Tuesdays and Thursdays, beginning September 21 at 5 P.M.

Emphasis is placed upon sampling methods and the importance of correct sampling procedures. The methods developed by Fisher for use with small samples will be discussed at length. Time will be devoted also to sampling methods and the importance of correct sampling procedures. The graduation of both frequency series and time series will be considered.

Prerequisite: Statistics 2 and Mathematics 2, or equivalent.

STATISTICS 4* - This course is offered only in the Spring semester. Class meets Tuesdays and Thursdays at 4:45 P.M. beginning January 11.

The various methods of correlation are applied to practical problems to bring out the proper application of correlation in statistical analysis, the limitations of correlation analysis, and the interpretation of results. Variance analysis is also applied to problems with special emphasis on the proper application of variance and its relation to correlation analysis. The principal text books used or referred to are Ezekiel's Methods of Correlation Analysis; Snedecor's Analysis of Variance and Co-Variance; Yule's introduction to the Theory of Statistics; Fisher's Statistical Methods for Research Workers.

Prerequisite: Statistics 3, or equivalent

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year)
STATISTICS 5 and 6 - will not be offered until 1938-39.

ADJUSTMENT OF OBSERVATIONS (year) Given in 1937-38 and alternate years. Instructor: Dr. W. Edwards Deming.

STATISTICS 7 - Fridays, beginning October 1 from 4:45 to 6:30 P.M.

Calculus is reviewed as necessary. Moment coefficients. Theory of Sheppard's corrections. The Gamma and Beta functions, complete and incomplete.

STATISTICS 7 - continued.
Moment coefficients of more complicated curves. Approximations to limits; asymptotic series. The point binomial, the Type III curve, and the normal curve. The multinomial expansion.

Prerequisite: Calculus, and statistics 4, or equivalent.

STATISTICS 8 - Continuation of the preceding course.

Mathematical sampling. Real sampling. The ergodic hypothesis and the specification of chance. Likelihood and the probability of causes, contrasted. History of Bayes' theorem. The confidence intervals of Neyman and Pearson applied to the point binomial. Lexis and Poisson sampling. The Tchebycheff inequality. The statistics of a single sample, or the theory of errors. Estimation and statistical inference. Neyman and Pearson's classification of errors with regard to testing hypotheses. Two or more samples. The chi test and the analysis of variance. Curve fitting and least squares. Doolittle's and Aitken's solutions. The significance of parameters estimated by least squares. Confidence belt of a function.

Throughout the course the history and philosophy of the subject, and the fundamental assumptions in the applications of probability theory, will be kept in evidence.

MULTIVARIATE ANALYSIS - (year) Instructor: Mr. M.A. Girshick.

STATISTICS 9 - Higher Algebra - Tuesdays and Thursdays beginning September 23 from 8:00 to 8:50 A.M. (Hours subject to change if the class agrees on another time).

Determinants. Theory of linear dependence. Linear equations, homogeneous and non-homogeneous. Matrix algebra; calculation of the inverse matrix, application to linear equations. Linear transformations. Quadratic forms; the matrix and discriminant; reduction of a quadratic form to a sum of squares; characteristic equation; definite and indefinite forms. Pairs of quadratic forms, reduction to normal form.

Prerequisite: College algebra.

STATISTICS 10 - Mathematical Statistics (second semester)
Theorems on mean value; moment generating functions; the characteristic function. Multivariate normal distribution; joint moments of sample variances and covariances. Sampling from a bivariate normal population; joint distribution of variance and covariance; distribution of correlation coefficient when the population correlation is and is not zero. Least sqares; classical application; relation to maximum likelihood; discrete variables. Distributions of the multiple and partial correlation coefficients. Orthogonal polynomials. Derivations of some of Wilks', Pearson's and Neyman's distributions. Factor analysis. Canonical correlation. Non-normal distributions. Applications.

Prerequisites: Statistics 4 and 9; calculus.

STATISTICS SEMINAR - First and third Friday of each month, beginning October 15 from 10:30 A.M. to 1:00 P.M. Fee $1.00 per semester. Luncheon fee in addition. Membership will be limited to a restricted number of qualified research workers; applications to be considered in order of filing. This is not a credit course but part of the official program of Government work in which the School assists. Register Room 4090 South Building.

This seminar will be devoted to the explanation and discussion of current papers on statistical theory. It is designed to enable the membership to keep abreast of advances in statistical method. Each member of the group is expected to report on one or more papers in his special field during the year.

STATISTICAL THEORY AND METHOD IN GEOGRAPHICAL RESEARCH (year) - Thursdays beginning September 23 from 5:00 to 6:00 P.M. Instructor: John Kerr Rose. (One hour per week).

This course will consider the nature, utility and limitations of quantitative methods as applied in geography. After a general survey of the field of geography and of quantitative contributions which have been made thereto, specific problems in sections of the field (population distribution, agricultural geography, land utilization, climatology, etc.) will be considered.

Specific application and utility of descriptive, correlative, and sampling techniques will be emphasized. Particular attention will be given to measures of distribution and relationship as applied to data having a real distribution.

A working knowledge of both geography and statistics is highly desirable for the prospective student of this course, though the more important statistical techniques used in the course will be reviewed as needed.

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For other courses in statistics see also the listing under mathematics courses.

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ADVANCED INORGANIC ANALYTICAL CHEMISTRY (year) Tuesdays and Thursdays, beginning September 21 at 5:00 P.M. Instructor: Dr. James I. Hoffman.

During the first semester a study will be made of solvents and fluxes, and the composition, classification, and segregation of materials. This will be followed by a careful study of the general scheme of rock analysis and the application of common and special reactions in analytical procedures.

The work in the second semester will cover columetric analysis, organic reagents used in inorganic analyses, and diagrammatic outlines of procedures used in the analysis of selected materials. The evaluation of results and a discussion of probable and reasonable errors will conclude the course.

AN INTRODUCTION TO ORGANIC CHEMISTRY (year) Mondays and Thursdays, beginning September 20 at 4:50 P.M. in Room 1128 South Building. Instructor: Dr. E. P. Clark.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

ADVANCED ORGANIC CHEMISTRY (year) Tuesdays and Fridays, beginning September 21, at 4:50 P.M. Instructor: Dr. H. L. Haller.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins and sex hormones will be given. An elementary course in organic chemistry or its equivalent is a prerequisite.

SOILS: "Their Morphology, Genesis and Classification." (one semester) Mondays, Wednesdays and Fridays, beginning December 6 at 4:45 P.M. in Room 4003 South Building. Instructor: Dr. Charles E. Kellogg, Chief, Division Soil Survey. Fee $15.00 (3 semester credits).

The course will outline the principles of soil development with examples from the United States. Students should have had the equivalent of college freshman chemistry; previous training in plant physiology, geology, geography, and logic would be helpful, but not essential. The particular material drawn from these fields would be developed in the lecture and/or in assigned readings.

In the development of the course the subject matter will be treated in the following order:

(1) Brief history of the development of soil science, especially in its relationship to agriculture.

(2) The nature of soils. A summarized discussion of the principal properties of the soil mass such as color, texture, structure, colloids, and similar fundamental characteristics. This material will be treated briefly and only those important phases will be discussed which bear directly upon the remainder of the course.

(3) The factors of soil genesis.
  (a) Parent rocks and weathering.
  (b) Influence of living matter.
  (c) Influence of climate.
  (d) Influence of relief.

(4) Determination of soil morphology and the classification of types (briefly).

(5) The processes of soil development. This section will include about half or more of the course, and the great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed. These are: Calcification, podzolization, laterization, salinization, solodization, solonization, gleization.

(6) Systems of soil classification.

(7) A few lectures at the class summarizing the whole and discussing the implications and relationships to agriculture as a whole.

A second semester of this course will be followed with seminars on land classification; depending upon the wishes of the class one or two lectures at the close will be devoted to land classification.

GLASS BLOWING (year) Mondays and Wednesdays, beginning September 27, at 4:50 P.M. in Basement of Smithsonian Institution. Instructor: Dr. Leland B. Clark. Fee: including materials - $18.00 a semester.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice, while during the second semester the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work. Registration is limited to 10 students.

DETERMINATIVE MINERALOGY (year) Mondays and Wednesdays, beginning September 27 at 4:50 P.M. Instructor: Jewell G. Glass. Registration limited to 20 students.

This course is designed for students who wish to acquire a practical knowledge of the physical and optical properties of the common rock forming minerals. Students should have had the equivalent of college freshman chemistry and physics, but not essential. The course will embrace the following topics;

I. General physical properties of minerals.
   A. A study by inspection of the individual minerals, in hand specimens, both in crystal form and in rock masses.
   B. Descriptive physical characteristics.
   C. Chemical properties; simple laboratory tests.
II. Introduction to the use of the petrographic microscope.
   A. Technique of preparation of rocks and minerals for microscopic study.
   B. Determination of minerals in crushed grains.
   C. Determination of minerals in thin section.

PLANT ECOLOGY (year) Mondays, Wednesdays and Fridays, beginning October 4 at 4:50 P.M. Instructor: Dr. M.B. Waite.

First semester.--Plant ecology, general.--The general principles of plant ecology, including the soil, climatic, and biotic factors influencing the principal native plant formations of the United States and the principal crop-plant regions. The ecology of cultivated crop plants will be stressed. The viewpoint of plant ecology, methods of study, and observation, as bearing on problems in botany and phytotechny will be developed. Prerequisites, a general knowledge of botany and of agriculture.

Second semester.-- The ecological factors will be discussed in relation to the non-parasitic, the virus and the parasitic diseases of plants. The ecology of insect transmission of diseases will be considered. The ecology in health and disease of the leading crop plants will form a major part of the course.

PLANT DISEASES WITH SPECIAL REFERENCE TO CAUSE AND CONTROL
Mondays Wednesdays and Fridays beginning October 4. This course is expected to alternate with Ecology. If there is a greater demand for this course it may be substituted for Plant Ecology.

PRINCIPLES OF ANIMAL PATHOLOGY (one semester - 4 semester credits) Two lectures of one hour each, and two laboratory sessions of two hours each per week. Lectures from 5 to 6 P.M., laboratories from 7 to 9 P.M., on Mondays and Wednesdays, beginning September 27, or days to meet the convenience of the class. Instructors: Dr. E. W. Price, Sr. Parasitologist, and Dr. Chas. Wm. Rees, Associate Zoologist.

This series of lectures and laboratory exercises will cover the general phonomena of disease, pigmentation, degeneration and infiltration, necrosis, atrophy, hypertrophy, inflammation and tumors. The course will be supplemented by special lectures on selected topics by invited experts.

Prerequisite: Normal histology. Fee $25.00 plus $2.50 for slides and materials.

SYSTEMATIC BOTANY (year) Mondays and Wednesdays, beginning September 27 at 4:50 P.M. Instructor: Dr. S. F. Blake.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles and classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower are studied. The principles of botanical nomenclature are discussed and some of the more important floras and nomographs examined. The second semester beginning January, 1938, will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

PLANT BREEDING WITH SPECIAL REFERENCE TO DISEASE RESISTANCE (one semester) Mondays and Wednesdays, beginning October 11 at 5:00 P.M. in Room 212 Fruit Producers Building, Beltsville. Instructor: Dr. F. J. Stevenson, assisted by other specialists. This course will be given from the genetic standpoint. Pathological aspects will be incidental.

Part I. General review of fundamental genetics with illustrations relating to disease resistance in plants. (12 lectures).

Part II. Discussion of special disease resistance problems with respect to (1) genetical basis of inheritance, (2) factors affecting expression of resistance, (3) biologic strains of the organism, and (4) related problems of yield, quality, etc. (19 lectures).

Resistance to rust diseases -- wheat, oats, rye, beans;
Resistance to smut diseases -- wheat, oats, corn;
Resistance to fusarium diseases -- cotton, flax, pea, cabbage, tomato, watermelon;
Resistance to virus diseases -- sugar beet, sugar cane, potato, cucumber, bean, tobacco, raspberry;
Resistance to bacterial diseases -- pear, bean, cucumber, sweet corn;
Resistance to miscellaneous diseases, such as -- potato blight, wart, and scab, sugar beet leaf spot, bean anthracnose, strawberry leaf spot.
Final lecture - summarization of technique and major objectives.

Prerequisite: B. S. degree.

CLIMATOLOGY (second semester) - Tuesdays and Thursdays, beginning October 19, from 5:15 P.M. to 6:15 P.M. This is a continuation of the first semester course conducted during the spring term of 1937. Instructors: Dr. Edgar W. Woolard and Jos. B. Kincer, U. S. Weather Bureau, assisted by specialists.

A preliminary group of lectures will present some of the fundamental principles of general descriptive and physical meteorology that are of especial importance in climatology. They will be followed by: a set of lectures on the basic principles of climatology (including climatological observations, factors which control climates, the classification of climates, etc.); a discussion of the climates of the world, with especial reference to the United States; climatological literature and its effective use; and lectures on climatic fluctuations and trends, including geological and prehistoric climates. The course will conclude with a group of lectures on the relations of climatology to other fields, especially geography, and on various applications of climatology. With the exception of the final group, the lectures will be given by various specialists of the Weather Bureau; the final lectures will be handled by specialists in other Bureaus of the Department.

PHYSIOLOGICAL CHEMISTRY (year) - Tuesdays and Thursdays, beginning September 28 from 8:00 to 9:00 A.M. in Room 5167 South Building. (Hour to be arranged if morning hour not satisfactory). Instructor: Dr. Herbert O. Calvery.

First semester. - A lecture course on the elementary principles of biochemistry will be developed which will require as a prerequisite a course in organic chemistry. The course will deal with the chemistry of the proteins, fats, and carbohydrates; the general chemical composition of animal tissues, e.g. muscle, nerve, milk, and blood; a brief discussion of the enzymes of the gastro-intestinal tract; and finally, the digestion and absorption of the principal foodstuffs.

Second semester. - This will be a continuation of the first semester course and will include discussion of the metabolism of the proteins, fats, and carbohydrates, as well as mineral metabolism; the chemical constituents of the urine; and finally, a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (One semester) Mondays, Wednesdays, and Fridays, beginning September 20 at 4:50 P.M. in Room 505 Administration Building. Instructor: Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Registration limited to 40 students.

This course is intended primarily for those seeking information on the editorial technique involved in handling manuscripts after they leave the authors' hands and until they are issued in printed form. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; considerations governing titles, tables of contents, headings, footnotes, illustrations, literature citations and bibliographies, and statistical checking; the principles of table formation and arrangement; typography and the relation of type to subject matter; and the fundamentals of indexing and proof reading. Practical examples of editorial work will be discussed in class. Opportunity for some familiarity with the Style Manual of the Government Printing Office will be provided. Collateral reading will be indicated. Those desiring credit for the course will be required to pass a written examination at the end of the semester.

DESCRIPTIVE ENGLISH GRAMMAR (year) Mondays and Wednesdays, beginning September 27 at 4:50 P.M. Instructor: Dr. Susan E. Harman, Associate Professor of English, University of Maryland.

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

THE POETRY OF ROBERT BROWNING (year) Mondays and Wednesdays, beginning September 27 at 4:50 P. M. Instructor: Dr. Homer C. House, Professor and Head of the Department of English, University of Maryland.

Lectures on the themes and art of the poet. Class papers based on interpretative questions.

GOVERNMENT CORRESPONDENCE (one semester) Mondays, Wednesdays and Fridays, beginning September 27 at 4:45 P.M. Instructor: Mary H. Sanders, in charge General Correspondence Group, Project Planning Section, Resettlement Administration.

This work is planned to help those who are engaged in the handling of Government correspondence. The course includes a thorough review of the rules of English grammar and punctuation; a study of sentence structure to effect clear, forceful expression; planning letters with special reference to paragraphing for clearness and emphasis; discussions of problems connected with the preparation of special types of correspondence and Governmental reports.

ELEMENTARY SCIENTIFIC FRENCH (year) Mondays and Wednesdays, beginning September 20 from 8:00 to 9:00 A.M. in Room 5610 South Building. Instructor: Dr. Harry B. Humphrey.

Instruction in elements of French grammar. Reading and translation of elementary articles from selected scientific texts. This course is designed to prepare beginners for the advanced course in Scientific French.

ADVANCED SCIENTIFIC FRENCH (year) Mondays and Wednesdays, beginning September 20 from 4:45 to 5:45 P.M. in Room 5610 South Building. Instructor: Dr. Harry B. Humphrey.

ELEMENTARY GERMAN (year) Mondays, beginning September 20, from 5 to 7 P.M. Instructor: Dr. C. H. Leineweber.

SCIENTIFIC GERMAN (year) Fridays, beginning September 24 from 5 to 7 P.M. Instructor: Dr. C. H. Leineweber.

ADVANCED GERMAN (year) Tuesdays, beginning September 21 from 5 to 7 P.M. Instructor: Dr. C. H. Leineweber.

This course is a continuation of first year German.

ELEMENTARY RUSSIAN (year) Wednesdays, beginning September 22 from 5 to 7 P.M. Instructor: Dr. C. H. Leineweber.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Methods.

ADVANCED RUSSIAN (year) Thursdays, beginning September 23 from 5 to 7 P.M. Instructor: Dr. C. H. Leineweber.

Commercial Russian. Translations of scientific articles on agricultural and kindred subjects. Outside reading and written reports relating to the particular science in which the student is interested. Textbook: Bondar's Simplified Russian Method, Commercial Part. Prerequisite: Two semesters of Russian grammar and reading.

ELEMENTARY SPANISH (year) Mondays, beginning September 20 from 5 to 7 P.M. Instructor: Miss Roberta M. Olds.

This course aims to secure accuracy and facility in the use of the language by means of drill in pronounciation, grammar, translations, and reading. Reading of less difficult modern prose with practice in composition, diction and conversation.

(A text containing the fundamentals of Spanish grammar will be completed. A reader with selections appropriate to Spain and Spanish-American countries will be used).

ADVANCED SPANISH (year) Wednesdays, beginning September 22 from 5 to 7 P.M. Instructor: Miss Roberta M. Olds.

A brief review of grammar with continued study of pronounciation and practice in oral and written composition. A study of Spain and Spanish-America through use of maps, Spanish papers, and appropriate texts. Reading of short selected works of modern authors. Dictation and conversation.

(A brief text combining grammar review and composition will be used. Suitable readings selected)

ELEMENTARY ITALIAN (year) Tuesdays, beginning September 28 from 5 to 7 P.M. Instructor: Dr. Nicholas G. Barbella.

This course aims to master the fundamentals of the language, and practice in conversation. Text book used - Joseph L. Russo, Elementary Italian Grammar. Second semester: Reading of Marraro's "Contemporary Italian Short Stories."

ADVANCED ITALIAN (year) Tuesdays, beginning September 28 from 5 to 7 P.M. Instructor: Dr. Nicholas G. Barbella.

The course is planned to meet as far as possible the individual needs of the student. Reading and translation of scientific articles selected by the student in the field he is interested. Prerequisite: Elementary Italian.

TECHNICAL SHORTHAND SPEED WRITING (one semester) Mondays and Wednesdays, beginning September 20 at 4:45 P.M. Instructor: Clara E. Richter. (Entrance speed to be 100 words per minute.

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed; in addition, supplementary relevant material will be used. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand which they write prior to entering the class. A non-technical entrance examination will be held Saturday, September 11, in Room 4090 South Building at 2 P.M., at the rate of 100 words per minute. Transcription must be in ink. It is required that each student have an admission card to the examination room which can be obtained from the Graduate School, Room 4090 South Building. All admission cards must be secured prior to date of examination.

A class ranging from 130 to 170 words will be formed if a sufficient number of persons register.

GRAPHIC PRESENTATION

Four major study courses in this subject are now offered by the Graduate School. The subject has a three-fold purpose: First, training in graphic expression; second, developing draftsmen as designers and supervisors, whether in the architectural or the mechanical fields; third, training in the reading of blue prints and specifications. The cost per course will be $20.00 for each semester. Prerequisite: 15 standard high school units or equivalent.

ARCHITECTURAL DRAWING. - Instructor: Mr. H. A. Magnuson.

Mondays and Wednesdays, beginning September 27.
5:30 to 7:30 P.M. (Elementary: Architectural symbols, perspective shadows, pencil technique, lettering.

7:30 to 9:30 P.M. (Advanced: Plan studies, exterior designs, rendering.

FREEHAND DRAWING. - Instructor: Mr. H. A. Magnuson.

Tuesdays and Fridays, beginning September 28.
5:30 to 7:30 P.M. (Elementary: Perspective in nature, illustrator's perspective, lettering, pencil technique.

7:30 to 9:30 P.M. (Advanced: Black and white ads, design and composition, color studies, magazine covers, posters.

MECHANICAL DRAWING. - Instructor: Mr. E. A. Garlock.

Mondays and Wednesdays, beginning September 27.
5:30 to 7:30 P.M. (Elementary mechanical drawing, descriptive geometry, advanced mechanical drawing, mechanical systems - electrical, heating and ventilation, refrigeration and air conditioning, sanitation and plumbing.

BLUEPRINT READING. - Instructor: Mr. E. A. Garlock.

Tuesdays and Fridays, beginning September 28.
5:30 to 7:30 P.M. (Interpretation of symbols, reading dimensions and checking, correlation of drawing and specification, mechanical requirements, quantitative analysis, estimating costs, U.S. Govt. specifications.

PRACTICAL PUBLIC SPEAKING (one semester) Mondays and Wednesdays, beginning September 27 at 4:50 P.M. Instructor: Mrs. Esther King.

The Graduate School of this Department has provided advanced classes in English Grammar and Composition and is continuing and enlarging this programme.

There are many government workers who are interested in a simpler non-credit course, such as is covered in the Practical English and Effective Speech course provided by the Better-Speech Institute of America. Many copies of this course have been made available to government workers through the Department Welfare Store, and many requests have been received by the Graduate School to organize a non-credit course, using these texts as a basis. This course will cover pronunciation, vocabulary development, enunciation, fundamental principles of effective oral expression, stage deportment, breathing exercises, practice in impromptu speaking, and practice in reading intelligently and intelligently from script (prepared for radio speaking).

An advanced credit course in EFFECTIVE SPEECH is provided in cooperation with American University.

LECTURES ON ADMINISTRATIVE MANAGEMENT

A special series of 10 lectures is being arranged under the general subject of administrative management. The Secretary of Agriculture will act as honorary chairman and Peter Keplinger will act as chairman. The tentative field covered is indicated below: Auditorium, South Building, Dept. of Agric.

1. The National Movement for Better Public Service
2. Objectives and Management
3. History and principles of Management
4. The Mechanisms of Management - Production
5. The Mechanisms of Management - Office
6. Relation of Organization to Management
7. The Art of Management
8. The Employee and Management
9. The Public's Interest in Public Management
10. Education in Management

(A more detailed announcement will be available later).

BASIC PHOTOGRAPHY.

It is planned to offer the course in Basic Photography, beginning January, 1938. Those interested will kindly notify the Graduate School for further announcement.

LECTURES ON CONSERVATION OF HEALTH

Fifteen lectures on Conservation of Health are being planned with the cooperation of the U. S. Public Health Service. These lectures will be given once a week in the late afternoon in the Auditorium of the Department of Agriculture, beginning in October, 1937. They will be free except for a nominal fee for registration. The best available experts in each field presented will be secured as lecturers. Special announcement will be available later.

SURVEY OF PUBLIC PERSONNEL MANAGEMENT*

The following is a brief outline of the subject-matter of the course:

1. Historical Background of American Personnel Management
2. Rise and Development of Unions in Public Service
3. Organization of Personnel Administration
4. General Problems of Recruitment
5. Technique of Testing
6. Certification
7. Classification
8. Training
9. Transfer and Promotion
10. Lay Off and Reinstatement
11. Efficiency Records
12. Discipline
13. Welfare Activities
14. Political Activities and Service Ethics
15. Conciliation Boards and Boards of Review
16. Retirement
17. Elements of a Career Service

Plan of Instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Fee - $22.50.

MANAGEMENT AND SUPERVISION *

The following is a brief outline of the subject-matter of the course:

1. Methods of Approach
2. The relationship of General Organization to Management and Supervision
3. Work-Planning, Scheduling and Follow-up
4. Job Analysis and Time Studies
5. Job Specifications
6. Standard Practice, Instructions, Routine and Procedures
7. Administrative Control (records, reports, inspection, etc.)
8. Coordination and Cooperation (including relationships arising out of line and staff functions)
9. The Process of Executive Decision
10. Performance Records (group and individual rating, scales, unit costs, etc.)
11. Incentives and Employee Relations
12. Training
13. Bases of Leadership

Plan of Instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Fee $22.50.

* In cooperation with American University.

Dr. A. F. Woods
Director, Graduate School
Room 4090 South Building
U. S. D. A.

I wish to register for the following courses:

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(Educational work completed giving schools and degrees:)

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Those who cannot pay full fee in advance must register at office. Upon receipt of fee, registration cards will be mailed.

Present position - Civil Service Status:

_____

Official Address _____ Telephone _____
(Where employed)

I will call at your office and complete registration _____

Name _____

Home address _____ Telephone _____

I enclose check or money order for _____

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

INTERRELATIONS BETWEEN ECONOMIC THEORY AND ACCOUNTING (year)
Tuesdays and Thursdays, beginning September 28th at 5 P.M.
Instructor: Mark S. Massel.
Prerequisite: Work in economic theory and accounting.

This course is designed to give graduate students of economics a non-technical description of accounting and related economic concepts. After setting up a mathematical interpretation of accounts the course will be devoted to economic interpretations of the accounting methods. The following points will be covered: purposive character of accounting; relationships between financial accounting (of assets, liabilities, capital, expense, income, profit and loss) and cost accounting.

Costs and prices. Direct costs - labor and material. The economist's versus the accountant's definition of overhead costs. Marginal versus average costs. Joint costs. Bulk-line costs. Statistical applications of costs. Cost indexes.

Concepts of capitalization and overhead - the increasing importance of these two factors. Depreciation, obsolesence and capital charges. Reserves. Changing structures of costs and expenses; influence on price and wage policies; relation to cyclical fluctuations; relation to concepts of competition. Fixed money contracts and fluctuating value of the dollar.

Accounting in relation to some current problems of public policy. T.V.A., N.R.A. Robinson-Patman Act.

U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL
1937-38

The general circular of information relative to courses of instruction available in the Graduate School of the U. S. Department of Agriculture for the second semester beginning January 24, 1937, may be obtained by sending name and address to Eva M. Johnson, Secretary, Graduate School, 4090 South Building, U. S. Department of Agriculture. The following courses are included:

* Accounting: First and Second Year
  Interrelations Between Economic Theory and Accounting
  Administrative Law
* Labor Law
* Political Economy and the Law
* History of Social Thought and Theory
* Social Ethics
* Philosophy (History of, and Modern)
  General Psychology
* Current Social Problems
* Management and Supervision
* Survey of Public Personnel Problems
  Social and Economic History of American Agriculture
  A Comparative Study of Current Economic Systems
  Contemporary Economic Problems
  Foreign Trade Problems and Policies in Relation to Agriculture
  History of Economic Thought
  Money and Banking
  Principles of Economics
* Elementary Statistical Analysis
  Advanced Statistical Analysis
  Statistics Seminar
  Adjustment of Observations
  Agricultural Price Analysis
* Beginning Algebra
* Mathematics of Finance
* Trigonometry and Analytic Geometry
  Integral Calculus
  Mathematical Analysis
* Linear Algebra
* Basic Photography
* The Principles and Practice of Graphic Presentation of Economic Data
  Freehand Drawing
  Blueprint Reading
  Architectural Drawing
  Mechanical Drawing

* NEW COURSES BEGINNING SECOND SEMESTER.

An Introduction to Organic Chemistry
Advanced Inorganic Analytical Chemistry
Advanced Organic Chemistry
Determinative Mineralogy
Glass Blowing (Scientific)
Soils: "Their Morphology, Genesis and Classification"
Physiological Chemistry
Plant Ecology
Systematic Botany
* The Nervous System and Animal Behavior
Lectures on Conservation of Health
* Radio Engineering
* Economics in French and German
* Practical Public Speaking
* Descriptive English Grammar
* Government Correspondence
* Seminar in Creative Writing
* Tennyson
* English Criticism
French - Elementary, Advanced and Scientific
German - Elementary, Advanced and Scientific
* Italian- Elementary and Advanced
Russian- Elementary
* Spanish- Elementary
Filing Seminar
Extension Seminar
Extension Theses
* Shorthand - Technical Speed Writing.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is twelve, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

A. F. Woods
Director, Graduate School

* NEW COURSES BEGINNING SECOND SEMESTER.

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AGRICULTURAL ECONOMICS

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

In response to a request from several of those who are interested in Advanced English, Dr. Homer C. House, Professor and Head of the Department of English, University of Maryland, has agreed to offer a course in the Poetry of Robert Browning, meeting Monday and Wednesday at 4:50 P.M. in Room 4034.

The first two or three sessions will be devoted to organizing the class and building it up to a suitable size. The course will run through the year and will carry four semester credits. Extra work for additional credit may be arranged if desired. The cost of the course will be $12.00 a semester. No delayed registration fee will be charged while this class is in process of organization.

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DESCRIPTIVE ENGLISH GRAMMAR (year) Mondays and Wednesdays, at 4:50 P.M. Instructor: Dr. Susan E. Harman, Associate Professor of English, University of Maryland.

A course in grammatical principles, stressing sentence structure and correct English form.

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GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (year)
Each semester may be taken separately. Time: any combination of two periods to suit the class constituency, beginning Wednesday, October 6, at 4:50 P.M. 150 minutes of class work per week for the two semesters will carry six semester credits. Instructor: Mr. Everett E. Edwards. No prerequisites. Fee $15.00 per semester.

In response to the demands that have come to the instructor, special attention will be given to the social conditions and attitudes of the rural population of America and especially as they were expressed in political, social, and economic movements. As in previous years, the various economic factors and developments relative to American agriculture will also be outlined and discussed. The subject will be considered in relation to the following outline.

First semester.--American agricultural history, its nature and objectives. Geographic factors as related to American agriculture. American Indian, English, Dutch, French, Spanish, etc., contributions. Social conditions in the English colonies along the Atlantic coast. Land systems and tenures in the English colonies, with special reference to land policies of later times. Agriculture in the English colonies. Trade and markets in the English colonies. Policies concerning the public domain, 1776 - 1862. Agrarian settlement of America, 1763 - 1850, and social conditions therein. Agriculture from the American Revolution to the Civil War. Transportation facilities and home and foreign markets. Political, social, and economic movements to 1860. Agriculture's relation to the sectional struggle.

Second semester.--Agriculture's relation to the sectional struggle. The agricultural revolution, its component elements and significance. Policies concerning the public domain since 1862. Agrarian settlement since 1850, especially in the trans-Mississippi west. History and significance of farm implements and machinery. Transportation facilities with reference to agricultural conditions. Development of domestic and foreign markets. Agencies promoting agricultural production and rural welfare,---leaders, societies, fairs, education, sciences, State and Federal departments. Agriculture since 1850 by regions and commodities. Political, social, and economic movements of rural America since the political revolution of 1860. Agriculture during and since the World War. Rural population and tenancy changes.

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THE UNITED STATES DEPARTMENT OF AGRICULTURE
THE GRADUATE SCHOOL
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CONSERVATION OF HEALTH

Tuesdays at 4 P.M. In the Auditorium, South Building
Beginning, November 9, 1937

This course of lectures deals with current developments in medical science for individual benefit and also to provide an understanding of public-health questions. Dr. Thomas Parran, Jr., Surgeon General, U. S. Public Health Service, is honorary chairman; Dr. John R. Mohler, Chief of the Bureau of Animal Industry, will preside at the lectures.

Register in Room 4090 South Building from 8:30 a.m. to 5:00 p.m.; Saturdays to 2:00 p.m. Reservations may be made by 'phone or mail. Call DIstrict 6350, Extention 317. Enrollment fee $3.00.

LECTURE SUBJECTS AND SPEAKERS

1. U. S. Public Health Objectives with Special Reference to Syphilis and Cancer --by Dr. W. F. Draper, Assistant Surgeon General, U. S. Public Health Service. ------- Nov. 9
2. Industrial Hygiene--by Dr. R. R. Sayers, Senior Surgeon, U. S. Public Health Service. ------- Nov. 16
3. Allergy (sensitiveness to certain foods, pollens, etc.)--by Dr. Warren T. Vaughan, Practicing Physician and Author, Richmond, Va. ------- Nov. 23
4. Poisonous Plants in Their Relation to Public Health--by Dr. James F. Couch, Chemist, Bureau of Animal Industry, U. S. D. A. ------- Nov. 30
5. Food Poisons and Poisonous Adulterations--by Dr. Albert C. Hunter, Senior Bacteriologist, Food and Drug Adm., U. S. D. A. ------- Dec. 7
6. Tuberculosis of Man and Animals--by Dr. M. P. Ravenel, Editor, Journal of the American Public Health Association, Columbia, Mo. ------- Dec. 14
7. Diseases Resulting from Nutritional Deficiencies--by Dr. E. V. McCollum, Johns Hopkins University, Baltimore, Maryland. ------- Jan. 4
8. Meningitis and Poliomyelitis--by Dr. J. P. Leake, Medical Director, U. S. Public Health Service. ------- Jan. 11
9. Public Health Education--by Dr. R. R. Spencer, Senior Surgeon, U. S. Public Health Service. ------- Jan. 18
10. Animal Parasites Transmissible to Man--by Dr. Benjamin Schwartz, Bureau of Animal Industry, U. S. D. A. ------- Jan. 25
11. Development and Trends in Public Health--by Dr. George C. Ruhland, Health Officer, District of Columbia. ------- Feb. 1
12. Cholera, Typhoid, and Dysentery (Amebic and Bacillary)--by Dr. R. E. Dyer, Senior Surgeon, U. S. Public Health Service. ------- Feb. 8
13. *Tularemia and Psittacosis--by Dr. Edward Francis, Medical Director, U. S. Public Health Service.

PERSONS WHO REGISTER FOR AND ATTEND THIS COURSE WILL NOT BE REQUIRED TO TAKE LEAVE FOR THAT PURPOSE.

* This lecture is listed tentatively.

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THE UNITED STATES DEPARTMENT OF AGRICULTURE
THE GRADUATE SCHOOL

Announces a course of two lectures by
FRANK YATES, M. A.
Chief Statistician, Rothamsted Experimental Station

Time and place: Thursday and Friday, the 28th and 29th October, 5 p.m. in Room 1039, Department of Agriculture.

Tickets for admission will be sold to the first 150 applicants, which number is the capacity of the room. The price of the tickets will be $1.50, and they will be for sale after the 23d October at the office of the Graduate School (Room 4090. Mail orders accompanied by check or money order will receive attention as if the application had been made in person at the time of receipt.

Subjects of the lectures

Lecture I. Principles underlying the design of factorial (complex) experiments.

Factorial design: its objects and advantages. A 2x2x2 experiment as a simple example.. Main effects and interactions. Gain in efficiency. Case of non-interacting factors. Factors at more than two levels: example of a set of 3x3x3 experiments. What is confounding? The inherent simplicity of confounding. Extention of the principle to non-factorial experiments. Example: balanced pairs vs. use of a control. Thurs., 5 p.m.

Lecture II. Contrasts between the methods of correlation and regression.

The case of two variables: relations between the variances, covariance, correlation coefficient, and the regression coefficients. The lack of any physical meaning of the correlation coefficient. Comparison of correlation coefficients frequently misleading. Examples. Influence of errors of observation of (a) the correlation coefficient, (b) the regression coefficient. More than two variables: partial correlations and regressions. Friday, 5 p.m.

Mr. Yates has kindly consented to meet with smaller groups for extempore discussion. Information and reservations for the conferences can be obtained at the office of the Graduate School.

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A course in the PRINCIPLES OF RADIO ENGINEERING is being organized at the request of a group of workers in the Patent Office. Arrangements are being made with Dr. Louis Cohen, formerly of the U. S. Bureau of Standards to give this course. Those interested should communicate at once with Mr. L. P. McCann, U. S. Patent Office, Br. 'phone 2551, or with Dr. A. F. Woods, Director, Graduate School, U. S. D. A., Br. 317. The cost of the course for the year will be $24.00, or $12.00 a semester.

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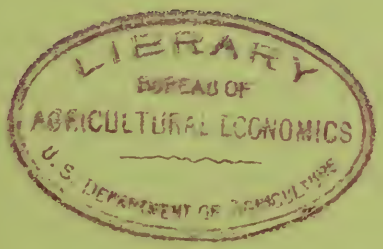
Conservation of Health



A SHORT COURSE OF LECTURES

Arranged by

THE GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

TUESDAYS AT 4 P. M.
IN THE AUDITORIUM, SOUTH BLDG.

Beginning November 9, 1937

23

THE COURSE

THIS course of lectures deals with current developments in medical science for individual benefit and also to provide an understanding of public-health questions. A limited number of enrollments from other Departments and agencies will be accepted. Dr. Thomas Parran, Jr., Surgeon General, U. S. Public Health Service, is honorary chairman; Dr. John R. Mohler, Chief of the Bureau of Animal Industry, will preside at the lectures.

Register in Room 4090 South Building from 8:30 a. m. to 5:00 p. m.; Saturdays to 2:00 p. m. Reservations may be made by 'phone or mail. Call DIstrict 6350, Extension 317. Enrollment fee $3.00.

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LECTURE SUBJECTS *and* SPEAKERS

U. S. Public Health Objectives with Special Reference to Syphilis and Cancer —*Nov. 9*
By Dr. W. F. Draper, Assistant Surgeon General, U. S. Public Health Service.

Industrial Hygiene —*Nov. 16*
By Dr. R. R. Sayers, Senior Surgeon, U. S. Public Health Service.

Allergy (sensitiveness to certain foods, pollens, etc.) —*Nov. 23*
By Dr. Warren T. Vaughan, Practicing Physician and Author, Richmond, Va.

Poisonous Plants in Their Relation to Public Health —*Nov. 30*
By Dr. James F. Couch, Chemist, Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture.

Food Poisons and Poisonous Adulterations —*Dec. 7*
By Dr. Albert C. Hunter, Senior Bacteriologist, Food Division, Food and Drug Administration, U. S. Department of Agriculture.

Tuberculosis of Man and Animals —*Dec. 14*
By Dr. M. P. Ravenel, Editor, Journal of the American Public Health Association, Columbia, Mo.

Diseases Resulting from Nutritional Deficiencies —*Jan. 4*
By Dr. E. V. McCollum, Johns Hopkins University, Baltimore, Md.

Meningitis and Poliomyelitis —*Jan. 11*
By Dr. J. P. Leake, Medical Director, U. S. Public Health Service.

Public Health Education —*Jan. 18*
By Dr. R. R. Spencer, Senior Surgeon, U. S. Public Health Service.

Animal Parasites Transmissible to Man —*Jan. 25*
By Dr. Benjamin Schwartz, Chief, Zoological Division, Bureau of Animal Industry, U. S. Department of Agriculture.

Development and Trends in Public Health —*Feb. 1*
By Dr. George C. Ruhland, Health Officer, District of Columbia.

Cholera, Typhoid, and Dysentery (Amebic and Bacillary) —*Feb. 8*
By Dr. R. E. Dyer, Senior Surgeon, U. S. Public Health Service.

*Tularemia and Psittacosis —*Feb. 15*
By Dr. Edward Francis, Medical Director, U. S. Public Health Service.

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*This lecture is listed tentatively. Definite announcement will be made later during a session of the course.

Man's Control of His Future

may depend, in the long run, on whether his biological knowledge which is constructive can keep up with his knowledge of the physical sciences, which has taught him so much about how to destroy.

This course deals with the protection and improvement of human health, with special emphasis on means of preventing impairment of vital functions. Much of the Department's work now involves food, drugs, housing, plant toxins, and animal diseases and parasites transmissible to man. Such Department activities thus have much in common with the objectives of public-health agencies.

Because of the wide scope of the subjects and the eminence of the speakers, this course should be of unusual interest and value.

HENRY A. WALLACE,
Secretary.

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GRADUATE SCHOOL
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SOILS: Their Morphology, Genesis and Classification. (one semester)

Mondays, Wednesdays and Fridays, beginning December 6 at 4:45 P.M. Register in Room 4090 South Building. Instructor: Dr. Charles E. Kellogg, Chief, Division Soil Survey. Fee $15.00 (3 semester credits).

The course will outline the principles of soil development with examples from the United States. Students should have had the equivalent of college freshman chemistry; previous training in plant physiology, geology, geography, and logic would be helpful, but not essential. The particular material drawn from these fields would be developed in the lecture and/or in assigned readings.

In the development of the course the subject matter will be treated in the following order:

(1) Brief history of the development of soil science, especially in its relationship to agriculture.
(2) The nature of soils. A summarized discussion of the principal properties of the soil mass such as color; texture, structure, colloids, and similar fundamental characteristics. This material will be treated briefly and only those important phases will be discussed which bear directly upon the remainder of the course.
(3) The factors of soil genesis.
    (a) Parent rocks and weathering.
    (b) Influence of living matter.
    (c) Influence of climate.
    (d) Influence of relief.
(4) Determination of soil morphology and the classification of types (briefly).
(5) The processes of soil development. This section will include about half or more of the course, and the great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed. These are: calcification, podzolization, laterization, salinization, solodization, solonization, gleization.
(6) Systems of soil classification.
(7) A few lectures at the class summarizing the whole and discussing the implications and relationships to agriculture as a whole.

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GRADUATE SCHOOL
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LECTURES ON CONSERVATION OF HEALTH

As there is room available in the Auditorium, the nine lectures beginning with Food Poisons and Poisonous Adulterations, Tuesday, December 7, will be available for $2.00. These lectures are proving very helpful and everyone who can possibly do so is urged to attend. The series has been highly commended by the Secretary and other high officials. Those who can arrange to attend will not be required to take leave for the purpose. The lectures begin at 4:00 P.M. and close promptly at 5:00 P.M.

The balance of the lectures include: Food Poisons and Poisonous Adulterations, Tuberculosis of Man and Animals, Diseases Resulting from Nutritional Deficiencies, Meningitis and Poliomyelitis, Public Health Education, Animal Parasites Transmissible to Man, Development and Trends in Public Health, Cholera, Typhoid, and Dysentery; Tularemia and Psittacosis (Rabbit Fever and Parrot Fever).

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SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (year)
Each semester may be taken separately. Time: any combination of two periods to suit the class constituency, beginning Wednesday, October 6, at 4:30 P.M. 150 minutes of class work per week for the two semesters will carry six semester credits. Instructor: Mr. Everett E. Edwards. No prerequisites. Fee $15.00 per semester.

In response to the demands that have come to the instructor, special attention will be given to the social conditions and attitudes of the rural population of America and especially as they were expressed in political, social, and economic movements. As in previous years, the various economic factors and developments relative to American agriculture will also be outlined and discussed. The subject will be considered in relation to the following outline.

First semester.--American agricultural history, its nature and objectives. Geographic factors as related to American agriculture. American Indian, English, Dutch, French, Spanish, etc., contributions. Social conditions in the English colonies along the Atlantic coast. Land systems and tenures in the English colonies, with special reference to land policies of later times. Agriculture in the English colonies. Trade and markets in the English colonies. Policies concerning the public domain, 1776 - 1862. Agrarian settlement of America, 1763 - 1850, and social conditions therein. Agriculture from the American Revolution to the Civil War. Transportation facilities and home and foreign markets. Political, social, and economic movements to 1860. Agriculture's relation to the sectional struggle.

Second semester.--Agriculture's relation to the sectional struggle. The agricultural revolution, its component elements and significance. Policies concerning the public domain since 1862. Agrarian settlement since 1850, especially in the trans-Mississippi west. History and significance of farm implements and machinery. Transportation facilities with reference to agricultural conditions. Development of domestic and foreign markets. Agencies promoting agricultural production and rural welfare,---leaders, societies, fairs, education, sciences, State and Federal departments. Agriculture since 1850 by regions and commodities. Political, social, and economic movements of rural America since the political revolution of 1860. Agriculture during and since the World War. Rural population and tenancy changes.

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In response to a request from several of those who are interested in Advanced English, Dr. Homer C. House, Professor and Head of the Department of English, University of Maryland, has agreed to offer a course in the Poetry of Robert Browning, meeting Monday and Wednesday at 4:50 P.M. in Room 4034.

The first two or three sessions will be devoted to organizing the class and building it up to a suitable size. The course will run through the year and will carry four semester credits. Extra work for additional credit may be arranged if desired. The cost of the course will be $12.00 a semester. No delayed registration fee will be charged while this class is in process of organization.

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DESCRIPTIVE ENGLISH GRAMMAR (year) Mondays and Wednesdays, at 4:50 P.M. Instructor: Dr. Susan E. Harman, Associate Professor of English, University of Maryland.

A course in grammatical principles, stressing sentence structure and correct English form.

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The registration in the course in ADMINISTRATIVE MANAGEMENT is slightly in excess of 300 which leaves some available space in the auditorium. Tickets for the remaining seven lectures, beginning Friday, October 22, will be available for $4.00. Register in room 4090 South building from 8:30 A.M. to 5:00 P.M.

The remaining lectures will be delivered by:

1. October 22 - The Art of Management
   by Robert B. Wolf: Manager, Pulp Division of Weyerhaeuser Timber Company; expert in Industrial Relations.

2. October 29 - The Philosophy of Management
   by Secretary E. G. Draper: Industrial Executive; Assistant Secretary of Commerce; member of the Academy of Political Science and the American Management Association.

3. November 5 - Relation of Organization to Management
   by Edgar W. Smith: Vice President of General Motors Export Corporation; author, and member of the American Management Ascociation.

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DEPARTMENT OF AGRICULTURE
FEB 28 1936

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LECTURES ON COOPERATIVE MEDICINE

A series of four lectures, followed by discussions, on the subject of group medicine will be held in the auditorium of the Department of Agriculture on Wednesday nights at 8:00 P.M., starting January 26, under the auspices of the Committee for Cooperative Medical Service for Federal Employees.

The Patient and Cooperative Medicine will be the subject of the first meeting. The speaker will be Dr. Kingsley Roberts, Director of the Bureau of Cooperative Medicine of The Cooperative League of the U. S. A. The meeting will be followed by an open discussion of the subject.

4. November 12 - The Mechanisms of Management - Production
by Col. George Babcock: Management expert R.E.A.; formerly Factory Manager Dodge Auto Company; member of the Society for the Advancement of Management; writer of Management subjects.

5. November 19 - The Employee and Management
(To be Selected)

6. November 26 - The Public's Interest in Public Management
by Mrs. W. F. Greenough: Chairman of the Department of Government and Its Operation, League of Women Voters; author and lecturer.

7. December 3 - Education in Management
by Dr. W. B. Donham: Dean Harvard School of Business Administration.

FEB 28 1938

UNITED STATES DEPARTMENT OF AGRICULTURE
Office of the Under Secretary

Special Series of Lectures on Democracy
M. L. Wilson, Under Secretary, Chairman

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With reference to the series of lectures on democracy announced in the recent statement of the Graduate School, it will probably be of interest to Department employees to learn of the people who have been invited to give these lectures.

The names of these people, together with the lecture subjects, are as follows:

Feb. 3	Introduction: What Do We Mean By Democracy? - M. L. Wilson
Feb. 10	The Rise of American Civilization - Charles Beard
Feb. 17	The Folklore of Capitalism - Thurman Arnold
Feb. 24	The American Cultural Pattern - Ruth Benedict
March 3	The Organization of Science for Social Ends - Paul B. Sears
March 10	Democracy's Competitors - Arnold Wolfers
March 17	Democracy and Foreign Policy - H. F. Armstrong
March 24	Discipline and Democracy - H. A. Wallace
March 31	Straw Polls - George Gallup
April 7	The Nature of Representative Democracy - Sir Willmott Lewis
April 14	The Place of the Political Machine - C. E. Merriam
April 21	Due Process of Policy Making - F. P. Miller
April 28	Size and Soundness in a Democracy - Herbert Agar
May 5	Social Dynamics and the Legislature - R. L. Buell
May 12	Social Dynamics and the Judiciary - Walton Hamilton
May 19	Social Dynamics and the Executive - Henry Toll
May 26	The Drift from Democracy - A. H. Sulzberger
June 2	The Administrative State - Herman Finer

Acceptances have already been received from Dr. Charles A. Beard, Dr. Ruth Benedict, Dr. George Gallup, Dr. R. L. Buell, and Dr. Herman Finer.

Donald C. Blaisdell

Donald C. Blaisdell,
Assistant to the Under Secretary.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Graduate School

Special Series of Lectures on Democracy
M. L. Wilson, Under Secretary, Chairman

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It is highly important that federal workers, especially those dealing with the problems of agricultural planning and administration, should be familiar with the requirements of democracy. To this end a special series of lectures has been planned to be conducted under the auspices of the Graduate School.

The lectures will be given on Thursdays from four to five P. M. in the auditorium, beginning February 3.

The general subjects to be treated will be:

1. The Meaning of Democracy
2. The Rise of American Civilization
3. The Folklore of Capitalism
4. The American Cultural Pattern
5. The Organization of Science for Social Ends
6. Democracy's Competitors
7. Democracy and Foreign Policy
8. Discipline and Democracy
9. Straw Polls
10. The Nature of Representative Democracy
11. The Place of the Political Machine
12. Due Process of Policy Making
13. Size and Soundness in a Democracy
14. Social Dynamics and the Legislature
15. Social Dynamics and the Judiciary
16. Social Dynamics and the Executive
17. The Drift from Democracy
18. The Administrative State
19. Democracy and Agricultural Programs

The most outstanding speakers in each of these fields will be obtained. The lectures will be limited to employees of the Department of Agriculture. They will not be open to the public. It is urged that those interested register at once with the Graduate School, Room 4090, South Building, Extension 317.

Attendance at these lectures will be treated as part of the official work of the Department.

Fee for the series - $2.00

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DESCRIPTIVE ENGLISH GRAMMAR (one semester) Mondays and Wednesdays, beginning February 9 at 4:50 P.M. Instructor: Dr. Susan E. Harman, Associate Professor of English, University of Maryland.

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

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TENNYSON (one semester) Mondays and Wednesdays, beginning February 9 at 4:50 P.M. Instructor: Dr. Homer C. House, Professor and Chairman of English, University of Maryland.

A study of the poet's themes and technique; with some attention to scientific, industrial, and philosophical movements of the Victorian period.

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THE ENGLISH NOVEL (year) Tuesdays and Thursdays, beginning February 15 from 5:00 to 6:15 P.M. Instructor: Albert S. Kerr. (Three semester credits).

As a part of the program of the Graduate School in preparation for authorship, courses are offered in various subjects in English including advanced grammar, English composition, criticism, Browning's poetry, Tennyson's poetry, editing, etc.

There will be available, beginning with the second semester 1938, a course on the English Novel, under the leadership of Mr. Albert Santee Kerr. Mr. Kerr graduated from Franklin and Marshall College in 1926, was instructor in English at Lafayette College 1927-30; M.A. Columbia 1928; Cambridge University Summer School 1929. He is now engaged in continuing his studies of Victorian Novels at the Library of Congress and Columbia University.

The course will include the following:

First Semester: The course will begin with discussions of the purposes of novel-reading and novel-writing.

After a brief survey of the early forms of fiction, the epistolary and

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The Graduate School announces in connection with its Practical Public Speaking Class, that arrangements have been completed whereby periodical voice recordings will be made at various stages of development to measure the progress of each student. The class is limited to 15 members and meets from 5 to 6 P.M., Tuesdays and Thursdays. Enrollment closes February 16. Register Room 4090 South Building.

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picaresque traditions of the 18th century (Richardson, Fielding, Smollett, Sterne) will be followed by the novels showing the influence of the Romantic Revival (the Gothic Novel) and of the French Revolution. The rise of realism and of the "novel with a purpose" will be traced through the work of the earlier Victorians.

Second Semester: Beginning with the late Victorians, Hardy and Meredith, the course will treat developments during the last 60 years, particularly the extension of the realistic method under the influence of Continental writers and the new psychology.

The emphasis throughout will be upon content, philosophical, political, economic, religious, and socialogical, but significant changes in technique will be noted, along with the effects of changing modes of publication and distribution.

The course will be conducted in lectures and discussions, with rapid reading of numbers of novels. After conference with the instructor, each student will make a report on some particular interest of his own.

Text recommended: Pelham Edgar, The Art of the Novel, College Edition, NY, Macmillan, 1933.

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"The Administrative Management of the Government Needs Overhauling"

The above statement is qouted from the President's message to Congress, January 12, 1937. As Government employees, it behooves us all to inform ourselves on what is meant by Administrative Management—its principles and techniques. In order that we may all do so, I asked Dr. Woods to plan a course of instruction and invite the best speakers the country affords.

This series of lectures is the result. I hope there will be much departmental and individual profit from them.

HENRY A. WALLACE,
Secretary.

Administrative Management

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A SHORT COURSE

Given by

THE GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

FRIDAYS AT 5 P. M. IN THE AUDITORIUM

Beginning October 1

23

THE COURSE

THIS course deals with the basic subject matter of Administrative Management—its history and development, its philosophy, its principles, its technique, and its need. It is a comprehensive informational course on a subject of immediate concern to all Government employees. A limited number of enrollments from other Departments and agencies will be accepted.

Register in Room 4090 South building from 8:30 a. m. to 5:00 p. m.; Saturdays to 2:00 p. m. Reservations may be made by 'phone or mail. Call DIstrict 6350, Extension 317. Enrollment fee $5.00.

LECTURE SUBJECTS

The National Movement for Better Public Service —*Oct. 1*
By ORDWAY TEAD

Objectives of Management —*Oct. 8*
(To be selected)

History and Principles of Management —*Oct. 15*
By DR. H. S. PERSON

The Mechanisms of Management—Production —*Oct. 22*
By COL. GEORGE BABCOCK

The Philosophy of Management —*Oct. 29*
By SECY. E. G. DRAPER

Relation of Organization to Management —*Nov. 5*
By EDGAR W. SMITH

The Art of Management —*Nov. 12*
By ROBERT B. WOLF

The Employee and Management —*Nov. 19*
(To be selected)

The Public's Interest in Public Management —*Nov. 26*
By MRS. W. F. GREENROUGH

Education in Management —*Dec. 3*
By DR. W. B. DONHAM

THE SPEAKERS

IN ORDER to insure the broadest possible background and all recognized points of view, speakers are being selected from the leading professional management associations, from industry, from schools, and from Government itself. All are recognized leaders in the management field. Two additional speakers are to be selected.

ORDWAY TEAD: Past President, Society for Advancement of Management; Director. Harper & Bros., and editor, economic and business books; author of several books on Management and Personnel Administration subjects.

DR. H. S. PERSON: Management Engineer; author; lecturer Columbia University; consulting expert R. E. A., and member of Board of Directors of the Society for the Advancement of Management.

COL. GEORGE BABCOCK: Management expert R. E. A.; formerly Factory Manager Dodge Auto Company; member of the Society for the Advancement of Management; writer on Management subjects.

SEC'Y E. G. DRAPER: Industrial Executive; Assistant Secretary of Commerce; member of the Academy of Political Science and the American Management Association.

EDGAR W. SMITH: Vice President of General Motors Export Corporation; author, and member of the American Management Association.

ROBERT B. WOLF: Manager, Pulp Division of Weyerhaeuser Timber Company; expert in Industrial Relations.

MRS. W. F. GREENROUGH: Chairman of the Department of Government and Its Operation. League of Women Voters; author and lecturer.

DR. W. B. DONHAM: Dean Harvard School of Business Administration.

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THE GRADUATE SCHOOL OF THE DEPARTMENT OF AGRICULTURE

through the kind cooperation of

THE BELL TELEPHONE LABORATORIES, INC.

announces a course of

FOUR LECTURES

by

WALTER A. SHEWHART, Ph.D.

THE STATISTICAL METHOD FROM THE VIEWPOINT OF QUALITY CONTROL

Place: The Department of Agriculture Auditorium

Subjects and dates:

1. STATISTICAL CONTROL, Monday, 28th February, 5 p.m.
2. HOW ESTABLISH LIMITS OF VARIABILITY? Tuesday, 1st March 5 p.m.
3. HOW PRESENT THE RESULTS OF MEASUREMENTS OF PHYSICAL PROPERTIES AND CONSTANTS? Thursday, 3d March, 5 p.m.
4. THE SPECIFICATION OF ACCURACY AND PRECISION, Friday, 4th March, 5 p.m.

Registration: Register at the Graduate School (Room 4090) in advance if possible; no fee will be charged, since the lectures are made possible through the generosity of the Bell Telephone Laboratories, Inc. For circular of detailed information write or call the Graduate School (Agriculture, Room 4090, Branch 317).

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The lecture in the Conservation of Health series on February 15, in the auditorium of the South Building at 4 o'clock, will be by Mr. Ross Garrett, Coordinator of Public Health Facilities in the District of Columbia. This will interest government employees generally, and all are invited to attend without charge so far as the auditorium will permit. The lecture will be on "Health Facilities Available in the District of Columbia - How to Use Them and Obtain Their Services."

Plans for the last lecture of the series will be announced at the February 15th lecture. The final lecture will deal with the "Conservation of Hearing."

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A publication that may interest you is a new book entitled - LECTURES AND CONFERENCES ON MATHEMATICAL STATISTICS - delivered by J. Neyman at the Graduate School of the U. S. Department of Agriculture in April 1937. The book has been revised and supplemented by the author with the editorial assistance of W. Edwards Deming. Price $1.25.

Lectures

I - - On the Theory of Probability
II - On Probability and Experimentation
III - On the Testing of Statistical Hypotheses

Conferences

On Randomized and Systematic Arrangements of Field Experiments
On Certain Problems of Plant Breeding
On Statistical Methods in Social and Economic Research
Census by Sampling and Other Problems
On Time Series Analysis and Some Related Statistical Problems in Economics
On Statistical Estimation
Practical Problems and Various Attempts
to Formulate Their Mathematical Equivalents
An Outline of the Theory of Confidence Intervals

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MAR 15 1938

DISCOVERING OURSELVES: PSYCHOLOGY TODAY

This course is a presentation by authorities of the main fields of that science which seeks to enlarge the understanding of ourselves.

In the search for solutions of our many urgent problems we must seek the guidance of exact knowledge provided by all the sciences. Yet all knowledge of the world outside us can avail little unless we come to understand the world of our own minds.

This course offers a broad outline of the most recent scientific study of human personality. Because of the importance of the insights here presented by a notable group of authorities, this series of lectures affords an exceptional opportunity.

THE SUBJECTS AND THE SPEAKERS

DISCOVERING OURSELVES THROUGH PSYCHOLOGY — March 2
Dr. H. A. Overstreet, Professor and Head of the Department of Philosophy and Psychology, The College of the City of New York.

CHILD DEVELOPMENT AND INDIVIDUALITY — March 9
Dr. Arnold Gesell, Director of the Clinic of Child Development, Yale University. Illustrated by Motion Pictures.

MAIN TRENDS OF PSYCHOLOGY TODAY — March 16
Dr. Charles H. Judd, Professor and Head of the Department of Education, The University of Chicago.

PSYCHOLOGY IN THE EXPERIMENTAL LABORATORY — March 23
Dr. H. S. Langfeld, Professor of Psychology and Director of the Psychological Laboratory, Princeton University.

EXPLORING THE UNCONSCIOUS: THE METHODS AND ACCOMPLISHMENTS OF PSYCHOANALYSIS — March 30
Dr. Sandor Rado, Educational Director of the New York Psychoanalytic Institute.

MEASURING PERSONALITY — April 6
Speaker to be announced.

ON THE FRONTIERS OF MIND: RECENT RESEARCH IN EXTRA-SENSORY PERCEPTION — April 13
Dr. J. B. Rhine, Professor of Psychology, Duke University

THE GROWTH OF OUR SOCIAL ATTITUDES — April 20
Dr. Gardner Murphy, Assistant Professor of Psychology, Columbia University; Chairman, Society for the Psychological Study of Social Issues.

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THE PSYCHOBIOLOGY OF THE GREAT APES — April 27
Dr. Robert M. Yerkes, Professor of Psychobiology, Yale University, and Director of the Yale Laboratories of Primate Biology. Illustrated by lantern slides.

PSYCHOLOGY APPLIED: WHAT WE SHOULD KNOW ABOUT HUMAN NATURE — May 4
Dr. Daniel Starch, Consultant in Commercial Research, New York City; formerly Professor of Business Psychology, Graduate School of Business Administration, Harvard University.

THE RELATION OF PSYCHIATRY TO PSYCHOLOGY AND TO PRACTICE — May 11
Dr. Adolph Meyer, Psychiatrist-in-Chief, The Johns Hopkins Hospital.

THE OUTLOOK FOR FUTURE DISCOVERIES OF OURSELVES — May 18
Speaker to be announced.

Dr. Paul Kaufman will preside at the lectures.

Register in Room 4090 South Building from 8:30 a.m. to 5:00 p.m., Saturdays to 2:00 p.m. Reservations may be made by telephone or mail. Call DIstrict 6350, Extension 317. Enrollment fee $4.00.

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ADVANCED INORGANIC ANALYTICAL CHEMISTRY (second semester) Fridays, beginning February 18 from 5:00 to 7:00 P.M. Instructor: Dr. James I. Hoffman.

The work in the second semester will cover columetric analysis, organic reagents used in inorganic analyses, and diagrammatic outlines of procedures used in the analysis of selected materials. The evaluation of results and a discussion of probable and reasonable errors will conclude the course.

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LECTURE ON AGROECOLOGY

Dr. Basil Bensin, an internationally known Agroecologist, will present a special illustrated lecture on "Agroecology as a basic science of agriculture."

This lecture should be of interest to all working in the field of regional agricultural planning and conservation.

The lecture will be in the Auditorium, South Building, U. S. Department of Agriculture, Friday, April 22nd, from 4:45 to 5:45 P.M. There will be no charge for this lecture.

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OUTDOOR SKETCHING CLASS

In conjunction with the freehand drawing course of the Graduate School, there will be an outdoor sketching class formed on May 9th, continuing through and including June 27. Fee $5.00, plus the cost of a few materials. This class will meet every Monday at 5 p.m. for two hours. All renderings will be executed in pencil only. Studies will be made in selecting the subject, composing the picture and in "what not to render" for an effective reproduction.

The class will meet at the Mechanical Shops Building located on Constitution Avenue, (south side), between 12th and 14th Streets, S.W. Instructor: H. A. Magnuson.

DISCOVERING OURSELVES: PSYCHOLOGY TODAY

The remaining five lectures of the psychology series will be of particular interest and may be obtained for $2.00. They are as follows:

THE SUBJECTS AND THE SPEAKERS

Auditorium - South Building, 5 to 6 P.M.

THE GROWTH OF OUR SOCIAL ATTITUDES — April 20

Dr. Gardner Murphy, Assistant Professor of Psychology, Columbia University; Chairman, Society for the Psychological Study of Social Issues.

THE PSYCHOBIOLOGY OF THE GREAT APES — April 27

Dr. Robert M. Yerkes, Professor of Psychobiology, Yale University, and Director of the Yale Laboratories of Primate Biology. Illustrated by lantern slides.

PSYCHOLOGY APPLIED: WHAT WE SHOULD KNOW ABOUT HUMAN NATURE — May 4

Dr. Daniel Starch, Consultant in Commercial Research, New York City; formerly Professor of Business Psychology, Graduate School of Business Administration, Harvard University.

THE RELATION OF PSYCHIATRY TO PSYCHOLOGY AND TO PRACTICE — May 11

Dr. Adolph Meyer, Psychiatrist-in-Chief, The Johns Hopkins Hospital.

THE OUTLOOK FOR FUTURE DISCOVERIES OF OURSELVES — May 18

Dr. Hornell Hart, Professor of Social Ethics, Hartford Theological Seminary, Hartford, Connecticut.

Register in Room 4090 South Building from 8:30 a.m. to 5:00 p.m., Saturdays to 1:00 p.m. Reservations may be made by telephone or mail. Call DIstrict 6350, Extension 317.

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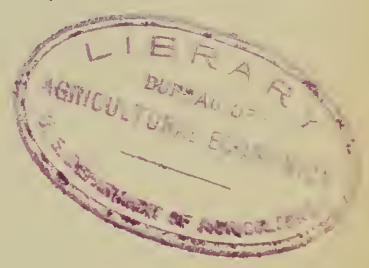
UNITED STATES

DEPARTMENT OF AGRICULTURE



GRADUATE SCHOOL

MAKING AVAILABLE, FACILITIES For STUDY AND RESEARCH

FOR THE YEAR 1937 - 1938

Second Semester Issue

Washington, D. C.

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

EDUCATIONAL COURSES - 1937-38

Second Semester Begins January 24, 1938

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The Graduate School of the United States Department of Agriculture opened the 1937-38 school year the week beginning September 20. Classes meet in the Department buildings at 4:45 P.M. or as soon thereafter as the students assemble. The tuition will be $12.00 a semester for two hour a week studies and $18.00 a semester for three hour a week studies, except as otherwise indicated. Registration fee for classes discontinued on account of small registration will be returned. Students withdrawing from classes having 15 or less will not be entitled to refund. A $3.00 registration fee is retained in case of withdrawal from continued classes. Cash refunds will not be made after the second week.

REGISTER IN ADVANCE. No one will be admitted to class without a registration card.

The Congress of the United States has made special provision for making the facilities for study and research in the Government Departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of departments and bureaus may prescribe. Joint Res. April 12, 1892 (27 Stat.395); Deficiency Act of March 3, 1901 (31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act establishing the department, a School of Graduate Studies was organized with the approval of the Secretary of Agriculture in 1921 for the benefit of department employees and such others as are qualified to undertake the work offered.

The work is organized on a standard college basis and certificates of credit for the work accomplished are issued on a standard unit basis. This work has been accepted by graduate schools and accredited colleges and universities wherever it fits in to the approved program of the students. Certain courses indicated by * are conducted in cooperation with the School of Public Affairs of American University.

The plan provides first for work by graduate or advanced students by special arrangement through the graduate schools of accredited colleges with the Graduate School of the Department of Agriculture for the utilization of the available facilities of Government laboratories and collections, in the study of an approved problem under the general supervision of a qualified government specialist.

The second type of work is formal class and laboratory work conducted after 4:30 P.M. or 1 P.M. Saturdays in such subjects as may be helpful to government workers. Everything necessary is done to insure the highest standard of work so that it may be satisfactory to the Government and cooperating colleges.

The Graduate School certifies credits earned. Acceptance, of course, depends on the rules of the college to which the credits are presented. The instructors are

selected from the best qualified members of the scientific and professional staffs of the various bureaus and nearby cooperating colleges. They are, of course, mostly in the Civil Service and hold their positions by reason of merit. They compare favorably with the staffs of the leading colleges and universities from which most of them are originally drawn.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is fifteen, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

Special series of lectures not included in this preliminary statement will be announced from time to time as plans for them are completed.

The latest catalogues of universities and colleges are available for consultation in the Office of the Director, Room 4090, South Building.

Inquiries regarding the school should be addressed to:

A. F. Woods
Director, Graduate School
U. S. Department of Agriculture
Room 4090 South Building.

ROOM ASSIGNMENTS FOR CLASSES MAY BE OBTAINED FROM THE DIRECTOR'S OFFICE.

STUDENTS REGISTERING IN THE GRADUATE SCHOOL, U.S.D.A., FOR CREDIT IN AMERICAN UNIVERSITY IN THE CASE OF COOPERATIVE COURSES WILL BE CHARGED $7.50 A CREDIT HOUR, UNLESS OTHERWISE STATED.

INDEX OF COURSES

	Page
Accounting -	
Principles of (beginning class)	5
Principles of (second semester)	5
Second Year	5
Income Tax Procedure	5
Mathematics of Finance	6
Interrelations between Economic Theory and Accounting	7
Agriculture, Foreign Trade Problems and Policies in Relation to	10
Agriculture, Social and Economic History of American	8
Agricultural Experiments, The Design of	21
Agricultural Price Analysis	7
Botany, Systematic	19
Chemistry -	
An Introduction to Organic Chemistry	21
Advanced Organic Chemistry	21
Advanced Inorganic Analytical Chemistry	22
Physiological Chemistry	21
Determinative Mineralogy	19
Ecology, Plant	19
Economics -	
A Comparative Study of Current Economic Systems	9
Contemporary Economic Problems	9
Economics in French	9
History of Economic Thought	7-8
Money and Banking	8
Political Economy and the Law	11
Principles of Economics	7
Extension Seminars	6
Extension Theses	6
Filing, Meetings of the Filing Seminar Group	14
Glass Blowing	19-20
Graphic Presentation -	
Architectural Drawing	23
Blueprint Reading	23
Freehand Drawing	23
Mechanical Drawing	23
The Principles and Practice of Graphic Presentation of Economic Data	23
Labor Law	10
Languages -	
English:	
Applied English Grammar	24
Descriptive English Grammar	24
Government Correspondence	24
Practical Public Speaking	24
Seminar in Creative Writing	25
Tennyson	24
French	25
German	26
Italian	25

INDEX OF COURSES

	Page
Russian	26
Spanish	26
Management and Supervision	14
Mathematics -	
Beginning Algebra	15
Calculus	15
Linear Algebra	16
Mathematical Analysis	15
Trigonometry and Analytic Geometry	15
Nervous System and Animal Behavior, The	22
Philosophy, History of	13
Photography, Basic	22
Psychology, General	12
Public Personnel Management, Survey of	13
Radio Engineering	14
Social Problems, Current	12
Social Thought and Theory, The History of	11
Statistics -	
Adjustment of Observations	18
Advanced	18
Advanced Course for Biological Workers	18
Elementary	17
Lectures and Conferences on Population Trends	16
Special Notice	16
Statistics Seminar	18
Registration Letter	27

BEGINNING CLASS IN - PRINCIPLES OF ACCOUNTING* - Mondays and Wednesdays, beginning January 31 at 5 P.M. Instructors: Dr. Oswald Nielsen, R. I. Robinson, Wm. H. Rowe and Geo. Y. Jarvis.

This will be first semester work and will take up the elementary principles and procedures of accounting. The work will be carried on by discussion and problems. It is expected that at the end of the semester the student will be prepared to devise the accounting records necessary for a small business organization, make the necessary entries in the records, draw off statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books. A two hour LABORATORY PERIOD (Fridays from 5 to 7 P.M.) is required for students taking course for credit unless specially excused by the instructor in which event two hours credit will be given for the course.

PRINCIPLES OF ACCOUNTING* (second semester) Tuesdays and Thursdays, beginning February 1 at 5 P.M.

The work during the second semester will deal with more advanced principles of accounting. Subject matter to be taken up will include the determination of income under special circumstances, the valuation of assets and depreciation policies, manufacturing accounts, partnership accounts, and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts. A two hour LABORATORY PERIOD (Thursdays from 6 to 8 P.M.) is required for students taking course for credit unless specially excused by the instructor in which event two hours credit will be given for the course.

SECOND YEAR ACCOUNTING*(second semester) Thursdays, beginning February 3, from 5 to 7:30 P.M. Instructor: Dr. Oswald Nielsen. Fee $22.50.

This course will include such topics as the correction of financial statements and books of account, comparative statements and the analysis of financial statements by means of financial and operating ratios and statements of sources and application of funds, statements of affairs, receivers accounts, realization and liquidation accounts, home office and branch accounting, and consolidated statements. Considerable emphasis will be given to the solution of problems in connection with such topics. Prerequisite: First year accounting.

INCOME TAX PROCEDURE*(one semester) Time and place to be announced.

A study of the federal income tax acts and their administration from the standpoint of tax return. The several forms used for the income tax returns are carefully analyzed. Detailed study is made of the various kinds of income exemptions and deductions. Thorough drill is given in finally computing the taxes. Numerous income tax problems are presented to the class for solution.

*In cooperation with American University.

MATHEMATICS OF FINANCE (one semester) Tuesdays and Thursdays, beginning February 1 from 5 to 6:30 P.M. Instructor: Wm. H. Rowe.

This course will deal with the calculation of compound interest, compound discount, sum of annuities, present value of annuities and perpetuities. It will include the determination of annual payments necessary to accumulate sinking funds and to amortize debts by installments and preparation of schedules for such accumulations and amortizations. The course will include the valuation of bonds in cases where the yield rate differs from the bond rate and the preparation of schedules for the amortization of premiums or accumulations of discounts on such bonds. Computation of depreciation by the sinking fund method, the fixed percentage of book value method, and other methods, as well as the preparation of schedules for the same will be included. Some study will be given to life probabilities, and the computation of premiums for the simpler types of life annuities and life insurance.

This course is given primarily for students of accounting, but others will be admitted to the course. The application to accounting will be reserved until the last third of the semester. For students not taking the accounting applications the course will be for ten weeks with two hours credit. For accounting students the course will continue five additional weeks for three hours credit. During that period the accounting aspects will be studied. Problems will include those of types given in C.P.A. examinations.

Prerequisites: Algebra; and for students taking the three hour course, one year of accounting.

EXTENSION SEMINARS (second semester) Instructor: M. C. Wilson. Twice per week, hour arranged to meet the convenience of class. Room 5534 South Bldg. Open to those with extension teaching experience, or with background of educational training satisfactory to instructor. No tuition fee.

3 Second semester.--Extension Administration and Supervision.

Principles of efficient extension administration; analyses of supervisory functions and procedures; duties of state and district supervisors of county agricultural agents and home demonstration agents; relations of state specialists and county workers. Practical study of the problems arising in the administration and supervision of extension at the college and in the field.

EXTENSION THESES.--Instructor: M. C. Wilson. Room 5534 South Building. Qualified students insterested in undertaking a research problem in extension education may receive credit for special problem work provided an acceptable plan is presented and the completed thesis meeting approval of a thesis committee. No tuition fee.

AGRICULTURAL PRICE ANALYSIS (second semester) Mondays and Fridays, beginning January 31 at 4:50 P.M. Instructor: Dr. F. L. Thomsen.

Time elements in prices. Research methods and materials in price analysis. Index numbers. Uses and limitations of multiple correlation in price analysis. Seasonal variation. Trends and cycles. A critical evaluation of progress to date in price analysis. Price forecasting. "Chart reading". Relation between cash and future prices. Factors affecting and methods of forecasting prices of the principal agricultural products.

Prerequisites: At least one course in statistical methods, and the first semester course (or its equivalent) dealing with price making forces, or price theory.

INTERRELATIONS BETWEEN ECONOMIC THEORY AND ACCOUNTING (second semester) Tuesdays and Thursdays, beginning February 1 at 4:50 P.M. Instructor: Mark S. Massel.

This course is designed to give graduate students of economics a non-technical description of accounting and related economic concepts. After setting up a mathematical interpretation of accounts the course will be devoted to economic interpretations of the accounting methods. The following points will be covered: Purposive character of accounting; relationship between financial accounting (of assets, liabilities, capital, expense, income, profit and loss) and cost accounting.

Concepts of capitalization and overhead - the increasing importance of these two factors. Depreciation, obsolesence and capital charges. Reserves. Changing structures of costs and expenses; influence on price and wage policies; relation to cyclical fluctuations; relation to concepts of competition. Fixed money contracts and fluctuating value of the dollar.

Accounting in relation to some current problems of public policy. T.V.A., N.R.A., Robinson-Patman Act.

Prerequisite: Work in economic theory and accounting.

PRINCIPLES OF ECONOMICS (second semester) Mondays and Wednesdays, beginning January 31 at 5 P.M. Instructor: Dr. E. W. Braun.

This course is designed to serve:

I. Students who wish a foundation for advanced economic theory.
II. Students who wish to link quantitative analysis with economic principles.

Emphasis will be placed upon the relation between economic principles and tendencies and frequency distributions, and time series including index numbers. The second semester will be devoted to a treatment of distribution of income and other subjects such as money and banking, business cycles, and institutional economics, depending upon the available time and desire of the students.

HISTORY OF ECONOMIC THOUGHT (second semester) Mondays and Wednesdays, beginning January 31 at 5 P.M. Instructor: Dr. Max J. Wasserman.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and mores which

HISTORY OF ECONOMIC THOUGHT - continued

conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresmo. The Merchantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pond, Rivere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill. The Socialists: La Salle, Marx, Engles, Proudhon. The German Historical School: Kneis, Hillebrand, Wagner. The Austrian School: Von Wieser, Böhm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative and welfare economics--Veblen, Pigou, J. M. Clark, J. R. Commons, R. G. Tugwell.

MONEY AND BANKING (second semester) Fridays, beginning January 28 from 7 to 9 P.M. Instructor: Dr. Max J. Wasserman.

This course will treat the following subjects:

Money: Medium of Exchange, Functions of Money, History of the United States Coinage, Paper Money, The Money System of the United States, Value of Money and Prices, Credit.

Banking: Origin and development of Banking, Banking development in the United States, Functions of the Bank, National Banking System, Administration, Deposits and Depositors, Clearing House, Domestic and Foreign Exchange, Loans and Discounts, Bank Supervision, Savings Banks, Trust Companies, Foreign Banking Systems, Defects of National Banking Systems, Federal Reserve System.

SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (second semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructor: Everett E. Edwards. Fee $15.00 (Three semester hours credit). No prerequisites.

In response to the demands that have come to the instructor, special attention will be given to the social conditions and attitudes of the rural population of America and especially as they were expressed in political, social, and economic movements. As in previous years, the various economic factors and developments relative to American agriculture will also be outlined and discussed. The subject will be considered in relation to the following outline.

Second semester.--Agriculture's relation to the sectional struggle. The agricultural revolution, its component elements and significance. Policies concerning the public domain since 1862. Agrarian settlement since 1850, especially in the trans-Mississippi west. History and significance of farm implements and machinery. Transportation facilities with reference to agricultural conditions. Development of domestic and foreign markets. Agencies promoting agricultural production and rural welfare, -- leaders, societies, fairs, education, sciences, State and Federal departments. Agriculture since 1850 by regions and commodities. Political, social, and economic movements of rural America since the political revolution of 1860. Agriculture during and since the World War. Rural population and tenancy changes.

CONTEMPORARY ECONOMIC PROBLEMS (second semester) Tuesdays and Thursdays, beginning February 1 at 5 P.M. Instructor: Dr. Max J. Wasserman.

This course will discuss the theoretical and practical aspects of the major economic problems confronting us at the present time. It will attempt to place each problem in its historical setting showing how it takes its roots in the past developments of economic society; to analyze the economic principles involved in the problem; to evaluate critically the various solutions proposed; and to suggest possible means of its solution. Among the problems which will be treated in the course the following may be cited:

I. Capitalism, Its Improvement and Substitute Economic Organizations.
   A. Necessary reforms in the structural organization of capitalism.
   B. Substitute forms of economic organization: Socialism, Communism, Fascism, and Syndicalism.
II. Problems of the Machine Industry.
III. Tariff in the light of international trade relations.
IV. Monetary reform, banks and the improvement of the credit system.
V. Selected Agricultural Problems:
   A. The adjustment of agricultural prices.
   B. Agricultural tenancy with special reference to sharecroppers.
   C. Problem of sub-marginal land.
   D. Conservation of natural resources.
VI. Selected problems in public finance.
   A. The basis of an equitable tax system.
   B. Growth of the public debt.
   C. Form of local taxes.
VII. Control of industry and trade.
   A. The Federal Trade Commission.
   B. N.R.A.
   C. Federal incorporation.
VIII. Some problems of unemployment.
IX. Social insurance.
X. Protection of the consumer.
XI. Future of American foreign trade.
XII. Low cost housing for slum clearance.
XIII. Price behavior trends in France.
XIV. Wages and hours of work in selected industries.

ECONOMICS IN FRENCH (one semester) Fridays, beginning February 4 from 4:45 to 6:30 P.M. Instructor: Dr. Walter Bauer.

Designed to aid Economics Majors in securing their language requirements for the Doctorate in Economics; to review in the original contributions to economic thought. Prerequisites: Advanced or Scientific French. Bachelor's degree. Graduate program majoring in Economics.

Plan of Course: The principal contributions to economic thought made by French economists will be discussed in French. Salient portions of their publications - made available in mimeographed form - will be translated and analyzed in class with a view to coining the proper English equivalents of terms and economic conceptions used by foreign economists.

A COMPARATIVE STUDY OF CURRENT ECONOMIC SYSTEMS (second semester) Mondays, beginning January 31 from 7:30 to 9:30 P.M. Instructor: Edward Berman.

Alternatives to the present economic system. This course will cover the following points: An analysis of the fundamental aspects of the present economic system; criticisms of that system by Socialists and Fascists; the study of the early Utopian Systems; Karl Marx and his economic ideas; Revisionary Socialism; Anarchism; Syndicalism; Guild Socialism, Communism and the Russian Revolution; the development of Socialism in Russia; Fascism and its development in Italy, Germany and other countries; the planning of a Socialist Society; the operations of Fascist Societies; cooperation as an alternative to the existing system.

LABOR LAW (one semester) Mondays and Wednesdays, beginning January 31 at 5 P. M. Instructor: Edward Berman.

This course will be devoted to a study of labor law both as it relates to the activities of trade unions and as it affects the constitutionality of labor legislation. The following subjects will be given attention: the doctrine of conspiracy; the principles of constitutional interpretation; the legality of strikes, boycotts and picketing; injunctions; anti-union contracts; the settlement of labor disputes; child labor laws; laws limiting hours of labor, especially for women; employers' liability; workmen's compensation; laws regulating convict labor; minimum wage laws, and the labor legislation of the New Deal.

Particular attention will be given to certain important recent developments including the Wagner Labor Relations Act and its effect; the Social Security legislation; the decisions affecting minimum wage laws; railroad retirement legislation; and the controversy over the Supreme Court.

FOREIGN TRADE PROBLEMS AND POLICIES IN RELATION TO AGRICULTURE (Second semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructors: L. A. Wheeler, assisted by specialists.

The object of this course is to present for discussion and analysis certain fundamental aspects of the foreign trade trends and policies of the United States and of the agricultural policies of foreign countries as they relate to American agriculture. While one or two lectures on international trade theory will be given and selected readings assigned early in the course to provide a general background, the course is intended primarily for graduate students who have already some training in theory.

During the second semester the following topics will be considered:

1 - The operation and results of agricultural policies in the British Empire, Germany, France, Italy, Russia, Argentina and other countries.
2 - Comparison of policies in principal deficit countries
3 - Comparison of policies in principal surplus countries
4 - International collaboration in the marketing of agricultural products - wheat and sugar.

POLITICAL ECONOMY AND THE LAW (year) Wednesdays and Fridays, beginning February 2 at 4:50 P. M. Instructor: Joseph G. Blandi, LL.B.; Ph.D.-Johns-Hopkins.

This course will embrace a discussion of the traditional view of the isolation of the law. It will point out the gradual change in this tradition and the persistent demand for coordination of the law with economics. It will analyze the scientific status of economics, and make plain its psychological promise and the element of explanation. The meaning of property from the point of view of quality and relation will be compared and distinguished. The legal and economic theories of property, such as the occupation and labor theories as well as the Hegolian principles, the Higher Law doctrine, will be critically studied, and it will bring forth to light the functional theory - the concept of property based upon its social utility, namely, the justification and distribution of property; the influence of class bias of unemployment, wages, hours of labor, collective bargaining, industrial insurance, and social security will be taken notice of throughout this discussion. No statement will be made without its support by competent and well-recognized authorities. The views on law and economics of the Chief Justice and other eminent justices of the Supreme Court, as embodied in their opinions will constitute the mainspring of this course. Numerous Supreme Court cases and the economic aspects involved in them will be discussed and analyzed. Among the decisions of the Supreme Court will be included the most recent adjudicated cases. The course will conclude with a lecture on law and economics in the light of the Mosaic and Ancient Legislation.

The course will be conducted in an informal manner. Students will be assigned definite reading of authorities dealing with our subject. On the basis of this reading, the discussion will proceed by the members of the class led by the lecturer. The students will be required to thoroughly familiarize themselves with the contents of the United States Constitution which will permeate this course.

THE HISTORY OF SOCIAL THOUGHT AND THEORY (one semester) Mondays and Wednesdays, beginning February 1 at 4:50 P.M. Instructors: Dr. Carl C. Taylor and Dr. C. P. Loomis.

This is a course in advanced sociology in which is considered the history of social philosophy, the history of social theories, and the historical and cultural foundations of modern society. Especial attention will be given to the influence which geographic, ethnic, biological, and economic factors have had on the evolution of historical and modern theories, and the part idealogies have had in shaping human institutions will be treated.

Prerequisites: At least six semesters in social science - sociology, economics, history, or political science - two of which must have been sociology.

GENERAL PSYCHOLOGY (second semester) Tuesdays and Fridays, beginning February 1 from 5 to 6:30 P.M. Instructor: Dr. Paul Kaufman. (three semester hours credit).

A general survey of the nature of human personality, studied by scientific methods. Following a preliminary outline of the leading current schools of psychological thought, presented in the perspective of older views of personality, the course proceeds to a description of the nervous system and sense organs. Analysis is then made of the elements of behavior at various levels. Among the processes examined are perceiving, imagining, learning, remembering, feeling, and thinking, with special attention to motivation in the emotions.

Other essential subjects considered are habit, intelligence, aptitudes, the subconscious, complexes, the resolution of conflicts, and the principal explanations of the relation between mind and body.

While emphasis is naturally placed upon the consciousness and behavior of adults, the psychology of the infant is summarized in relation to the problems of instinct and reflexes and to the factors of heredity and environment.

The couse is intended to be of practical value in developing a deeper knowledge of the individual self and in stimulating more effective adjustment to one's surroundings.

CURRENT SOCIAL PROBLEMS (one semester) Tuesdays and Thursdays, beginning February 8, from 7:30 to 9:00 P.M. Instructor: Dr. Paul Kaufman.

This outlined course surveys the following groups of problems as they affect American society at the present time:

Adjustments to natural resources
Trends of population
Race relations and immigration
Distribution of wealth and income
Poverty and unemployment
Health and physical welfare
Care and control of defectives
Crime, vice, and delinquency
Marriage and the family
Education and child welfare
Public opinion and its agencies
Social security
Social control in a democracy

The point of view and method of the course is scientific, with primary emphasis on the discovery of the facts, which are extensively presented in the basic text, Current Social Problems, by J. M. Gillette and J. M. Reinhardt (1937). With the aid of exact knowledge, supported by numerous references to authorities, the course aims to prepare for individual study of the problems.

HISTORY OF PHILOSOPHY (first semester) Tuesdays and Thursdays, beginning February 1 at 4:50 P.M. Instructor: Dr. George S. Painter.

(Greek Philosophy) The history of Greek Philosophy from Thales to Modern Time is the history of earliest human thought. So great was this intellectual movement that we find nearly all the fundamental concepts of science remarkably investigated and wonderfully developed within this period. Nothing is more fascinating than the history of scientific thinking.

This course offers the student an exposition and critical consideration of the philosophical development from the earliest problems that engaged reflective thought, through the systematic developments of Plato and Aristotle, and the various schools of philosophy growing out of these.

The problems of natural science, of being and becoming, and the problems of knowledge, of ethics, and of life, are all considered in their origin and simplest beginnings, where they are apprehended in their simplest form.

(The second semester will be offered September, 1938)

(Modern Philosophy) The history of Modern Philosophy begins with the Renaissance and comes down to the present time. It involves the fundamental concepts of all our modern thought, and the course of their development. Beginning with Campanella and Francis Bacon, the development advances with Descartes, Spinoza, Leibnitz, Locke, Berkeley, and Hume, and comes to critical climax in Immanuel Kant. The post-Kantian philosophy takes a new departure, and was developed under Fichte, Hegel, and Schelling, followed by the philosophy of Herbart, Schopenhauer, and others. Critical attention is given to each of these philosophers, with special consideration of the general development of thought, or the philosophy of the history of philosophy. The aim is to apprehend the basal concepts of human thought.

SURVEY OF PUBLIC PERSONNEL MANAGEMENT*

The following is a brief outline of the subject-matter of the course:

1. Historical Background of American Personnel Management
2. Rise and Development of Unions in Public Service
3. Organization of Personnel Administration
4. General Problems of Recruitment
5. Technique of Testing
6. Certification
7. Classification
8. Training
9. Transfer and Promotion
10. Lay Off and Reinstatement
11. Efficiency Records
12. Discipline
13. Welfare Activities
14. Political Activities and Service Ethics
15. Conciliation Boards and Boards of Review
16. Retirement
17. Elements of a Career Service

Plan of Instructions: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Fee - $22.50

* In cooperation with American University.

MANAGEMENT AND SUPERVISION *

The following is a brief outline of the subject-matter of the course:

1. Methods of Approach
2. The relationship of General Organization to Management and Supervision
3. Work-Planning, Scheduling and Follow-up
4. Job Analysis and Time Studies
5. Job Specifications
6. Standard Practice, Instructions, Routine and Procedures
7. Administrative Control (records, reports, inspection, etc.)
8. Coordination and Cooperation (including relationships arising out of line and staff functions)
9. The Process of Executive Decision
10. Performance Records (group and individual rating, scales, unit costs, etc.)
11. Incentives and Employee Relations
12. Training
13. Bases of Leadership

Plan of Instruction: Lectures by administrators in government, industry, and business as well as by recognized students of the subject. Fee $22.50

MEETINGS OF THE FILING SEMINAR GROUP - Chairman, John S. Lucas.

December 21 - Bureau of Forestry
January 7 - Food and Drug Administration
January 21 - Bureau of Home Economics
February 4 - Bureau of Plant Industry
February 18 - Office of Telephone and Telegraph
(Other meetings to be announced).

RADIO ENGINEERING

A course in Principles of Radio Engineering is under consideration to be given by Dr. Louis Cohen. If Dr. Cohen returns to Washington in time the course will be given beginning February, 1938. Further information regarding this course will be issued later.

MATHEMATICAL PREPARATION FOR STATISTICS

Students who are in doubt about the adequacy of their preparation, and any others who wish advice in the selection of mathematical courses, may consult Dr. Deming, Fridays, between 4 and 4:45 P.M., by making an appointment in advance; call Mrs. Johnson on Branch 317.

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BEGINNING ALGEBRA (one semester) Tuesdays and Thursdays, beginning February 1 at 4:50 P.M. Instructor: Dr. C. Winston.

This course is designed for students who have had no algebra, or who wish to review on that basis. It is aimed to prepare students in the algebra requirements for the course in college algebra.

MATHEMATICS 2* - TRIGONOMETRY AND ANALYTIC GEOMETRY. Tuesdays and Thursdays, beginning February 1 at 4:50 P.M. Instructor: Harry J. Winslow.
Mathematics 1 offered during the fall semester.

This is a continuation of course 1 (college algebra). The work in trigonometry will include a study of similitude of figures in Euclidean geometry; definitions of trigonometric functions; identities; complex numbers, DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves; polar coordinates; families of curves, one or more parameters, parametric equations of curves; radical axis, graphical solution of equations. Introduction of three-dimensional geometry.
Prerequisite: Mathematics 1 or its equivalent.

MATHEMATICS 4 - CALCULUS. A continuation of course 3. Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructor: Maurice K. Laufer. Text: Woods & Bailey, Elementary Calculus.

Calculus in polar and other coordinates; total and partial derivatives; Taylor's series in several variables, expansion of functions. Limits and convergence. Integration of more complicated expressions. Repeated integrals; use of tables of integrals. Applications to physics and statistics.
Prerequisite: The first semester or its equivalent.

MATHEMATICS 6 - MATHEMATICAL ANALYSIS. A continuation of course 5. Tuesdays and Thursdays, beginning February 1 at 4:50 P.M. Instructor: Albert Wertheimer.

The study of surfaces, tangent planes and normals. The Jacobian. Reciprocal determinants. Quadratic surfaces, ruled surfaces. Surface and volume integrals, multiple integrals and change of variables. Taylor's series in several variables; the propagation of error. Fourier series. Introduction to vector notation; matrix notation; application to tangent planes and normals. Geometry in higher dimensions. Discussion of linear equations, indeterminancy, near-indeterminacy, and collinearity.
Prerequisite: The first semester.

* In cooperation with American University.

MATHEMATICS 10 - LINEAR ALGEBRA. Tuesdays and Thursdays, beginning February 1 at 7:45 A.M. Instructor: M. A. Girshick.

Extensive discussion of polynomials and their properties. Further properties of determinants. Invariants, covariants, semi-invariants, annihilators, canonical forms of binary cubics and quartics. Further developments of the algebra of matrices. Symmetric polynomials. Elementary divisors. Equivalence of matrices.

This is a continuation of the course listed as Statistics 9; it or its equivalent is assumed as a prerequisite.

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A course in the MATHEMATICS OF FINANCE is listed with the accounting courses.

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STATISTICS

SPECIAL NOTICE:

In connection with the studies in mathematics and statistics, it should be mentioned that it is the plan of the Graduate School to bring to Washington annually one or two of the leaders in statistical thought for short courses of lectures and conferences. During the past year Professor R. A. Fisher and Dr. J. Neyman, both of London, have been brought here.

DR. WALTER SHEWHART of the Bell Telephone Laboratories has been engaged to deliver a series of four lectures some time in February. Definite announcement regarding subjects and dates will be available later. Kindly communicate with Graduate School for further notice.

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LECTURES AND CONFERENCES ON POPULATION TRENDS* (A series of 4 to 6 lectures By Professor Gunnar Myrdal of Sweden. (Secretary of the Official Population Commission of Sweden, Professor of Economics in the University of Stockholm; Senator).

Dr. O. E. Baker, U. S. Department of Agriculture and Dr. E. S. Griffith of American University, constitute the committee in charge.

Professor Myrdal speaks English perfectly and is a dynamic personality. He is a scholar recognized as one of the most competent men in the world in the field of population.

For further information communicate with the Graduate School.

* In cooperation with American University

STATISTICS: The sequence of courses outlined below provide a graduated series ranging from an elementary or introductory course to an advanced treatment of the mathematical and logical foundations of statistical theory. The mathematics courses are designed to prepare the student for the various statistical and higher mathematics courses for which they, or their equivalent, are prerequisite. In determining the adequacy of the equivalent of prerequisites for any course, the decision of the instructor of the class to which the student applies for admission will be final.

INTRODUCTION TO STATISTICAL ANALYSIS (year)
Instructors: B.R. Stauber and G.E. Ockey

STATISTICS 1*.

Tuesdays and Thursdays, beginning February 1 at 4:45 P.M. A laboratory period is arranged to meet the convenience of the class and required for students desiring college credit.

This semester is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs, and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, construction and significance of index numbers, and the analysis of time series data.

Prerequisite: Mathematics 1„ or equivalent.

STATISTICS 2*.

Mondays and Wednesdays, beginning January 31 at 4:45 P.M. A laboratory period is arranged to meet the convenience of the class and required for students desiring college credit.

This will be in continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to multiple linear correlation, and an introduction to the concept of variance analysis in relation to correlation.

Prerequisite: Elementary statistics 1, or equivalent.

STATISTICAL ANALYSIS (year)
Instructors: C. M. Purves and A. Sturges

STATISTICS 3* Offered only in the fall semester.

* In Cooperation with American University.

STATISTICS 4*.

Tuesdays and Thursdays, beginning February 1 at 4:50 P.M.

The various methods of correlation are applied to practical problems to bring out the proper application of correlation in statistical analysis, the limitations of correlation analysis, and the interpretation of results. Variance analysis is also applied to problems with special emphasis on the proper application of variance and its relation to correlation analysis. The principal text books used or referred to are Ezekiel's Methods of Correlation Analysis; Snedecor's Analysis of Variance and Co-Variance; Yule's Introduction to the Theory of Statistics; Fisher's Statistical Methods for Research Workers.

Prerequisite: Statistics 3, or equivalent.

ADVANCED COURSE IN STATISTICS FOR BIOLOGICAL WORKERS (year)
STATISTICS 5 and 6 - will not be offered until 1938-39.

STATISTICS 7 - ADJUSTMENT OF OBSERVATIONS. Offered during the fall semester.

STATISTICS 8 - ADJUSTMENT OF OBSERVATIONS.
Fridays, beginning February 4 from 4:45 to 6:30 P.M. Instructor: Dr. W. Edwards Deming. (Continuation of preceding course).

Mathematical sampling. Real sampling. The ergodic hypothesis and the specification of chance. Likelihood and the probability of causes, contrasted History of Bayes' theorem. The confidence intervals of Neyman and Pearson applied to the point binomial. Lexis and Poisson sampling. The Tchebycheff inequality. The statistics of a single sample, or the theory of errors. Estimation and statistical inference. Neyman and Pearson's classification of errors with regard to testing hypotheses. Two or more samples. The chi test and the analysis of variance. Curve fitting and least squares. Doolittle's and Aitken's solutions. The significance of parameters estimated by least squares. Confidence belt of a function.

Throughout the course the history and philosophy of the subject, and the fundamental assumptions in the applications of probability theory, will be kept in evidence.

STATISTICS SEMINAR (continuation of the first semester)
First and third Friday of each month, from 10:30 A.M. to 1 P.M. Fee $1.00 per semester. Luncheon fee in addition. Membership will be limited to a restricted number of qualified research workers; applications to be considered in order of filing. This is not a credit course but part of the official program of Government work in which the School assists.

This seminar will be devoted to the explanation and discussion of current papers on statistical theory. It is designed to enable the membership to keep abreast of advances in statistical method. Each member of the group is expected to report on one or more papers in his special field during the year.

DETERMINATIVE MINERALOGY (second semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructor: Jewell G. Glass. Registration limited to 20 students.

This course is designed for students who wish to acquire a practical knowledge of the physical and optical properties of the common rock forming minerals. Students should have had the equivalent of college freshman chemistry and physics, but not essential. The course will embrace the following topics:

I. General physical properties of minerals.
   A. A study by inspection of the individual minerals, in hand specimens, both in crystal form and in rock masses
   B. Descriptive physical characteristics
   C. Chemical properties; simple laboratory tests

II. Introduction to the use of the petrographic microscope
   A. Technique of preparation of rocks and minerals for microscopic study.
   B. Determination of minerals in crushed grains
   C. Determination of minerals in thin section

PLANT ECOLOGY (second semester) Mondays, Wednesdays and Fridays, beginning January 10 at 4:50 P.M. Instructor: Dr. M. B. Waite.

The ecological factors will be discussed in relation to the non-parasitic, the virus and the parasitic diseases of plants. The ecology of insect transmission of diseases will be considered. The ecology in health and disease of the leading crop plants will form a major part of the course.

SYSTEMATIC BOTANY (second semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructor: Dr. S. F. Blake.

The course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester was devoted to lectures on the general principles and classification and to the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower were studied. The principles of botanical nomenclature were discussed and some of the more important floras and nomographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

GLASS BLOWING (second semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. in Basement of Smithsonian Institution. Instructor: Dr. Leland B. Clark. Fee: including materials - $18.00 a semester.

Some form of glass apparatus enters every research problem of the physicist, chemist, bacteriologist, and biologist, and with the numerous and varied glasses now being produced, together with their particular technique requirements, the average researcher finds himself almost solely dependent upon a professional glass blower. This course will be a repetition of that

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GLASS BLOWING (continued)
given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" were utilized for practice, while during the second semester the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work. Registration is limited to 10 students.

SOILS: "Their Morphology, Genesis and Classification." (one semester) Mondays, Wednesdays and Fridays, beginning January 31 at 4:45 P. M. in Room 4003 South Building. Instructor: Dr. Charles E. Kellogg, Chief, Division Soil Survey. Fee $18.00 (3 semester credits).

The course will outline the principles of soil development with examples from the United States. Students should have had the equivalent of college freshman chemistry; previous training in plant physiology, geology, geography, and logic would be helpful, but not essential. The particular material drawn from these fields would be developed in the lecture and/or in assigned readings.

In the development of the course the subject matter will be treated in the following order:

(1) Brief history of the development of soil science, especially in its relationship to agriculture.

(2) The nature of soils. A summarized discussion of the principal properties of the soil mass such as color, texture, structure, colloids, and similar fundamental characteristics. This material will be treated briefly and only those important phases will be discussed which bear directly upon the remainder of the course.

(3) The factors of soil genesis.
- (a) Parent rocks and weathering.
- (b) Influence of living matter.
- (c) Influence of climate.
- (d) Influence of relief.

(4) Determination of soil morphology and the classification of types (briefly).

(5) The processes of soil development. This section will include about half or more of the course, and the great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed. These are: Calcification, podzolization, laterization, salinization, solodization solonization, gleization.

(6) Systems of soil classification.

(7) A few lectures at the class summarizing the whole and discussing the implications and relationships to agriculture as a whole.

A second semester of this course will be followed with seminars on land classification; depending upon the wishes of the class one or two lectures at the close will be devoted to land classification.

THE DESIGN OF AGRICULTURAL EXPERIMENTS (one semester) Wednesdays and Fridays, beginning February 2 at 4:50 P.M. Instructor: Dr. A.E. Brandt.

Students should be able to handle arithmetic and simple algebra. Opportunities will be provided for those with higher training in mathematics to use it if desired.

Special emphasis will be placed on the purpose of a design, its arithmetic specification and the statistical analysis of the observations. The concept of independent comparisons or individual degrees of freedom will be used. Various types of randomized block experiments, Latin squares, factorial and pseudo factorial designs will be discussed in detail. Methods of controlling heterogeneity such as confounding and partial confounding will be included with a careful examination of the proper method of analyzing data from experiments involving these methods.

PHYSIOLOGICAL CHEMISTRY (second semester) Tuesdays and Thursdays, beginning February 1 from 7:45 to 8:40 A.M. in Room 5167 South Building. Instructor: Dr. Herbert O. Calvery.

This will be a continuation of the first semester course and will include discussion of the metabolism of the proteins, fats, and carbohydrates, as well as mineral metabolism; the chemical constituents of the urine; and finally, a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

AN INTRODUCTION TO ORGANIC CHEMISTRY (second semester) Mondays and Thursdays, beginning January 31 at 4:50 P.M. in Room 1128 South Building. Instructor: Dr. E. P. Clark.

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester was devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

ADVANCED ORGANIC CHEMISTRY (second semester) Tuesdays and Fridays, beginning February 1 at 4:50 P.M. Instructor: Dr. W. G. Rose.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins and sex hormones will be given. An elementary course in organic chemistry or its equivalent is a prerequisite.

ADVANCED INORGANIC ANALYTICAL CHEMISTRY (second semester) Fridays, beginning February 4 from 5:00 to 7:00 P.M. Instructor: Dr. James I. Hoffman.

The work in the second semester will cover columetric analysis, organic reagents used in inorganic analyses, and diagrammatic outlines of procedures used in the analysis of selected materials. The evaluation of results and a discussion of probable and reasonable errors will conclude the course.

THE NERVOUS SYSTEM AND ANIMAL BEHAVIOR (one semester) Mondays and Thursdays, beginning January 31 from 5:30 to 6:30 P.M. Instructor: Dr. Charles Wm. Rees.

BASIC PHOTOGRAPHY (one semester) Mondays and Wednesdays, beginning Wednesday, February 2 at 4:50 P.M. Instructor: Mr. Carl H. Hanson and other specialists. Registration limited.

There are no special prerequisites. The fee for the course is $12.00. The course will be elementary and basic in character and will be designed to meet the needs of the amateur. Text: Air Corps Training Manual No. 2170-5, "Basic Photography." For sale by the Superintendent of Documents - price 50 cents.

Tentative Outline of the Course in Basic Photography:

Elementary photographic optics
Selection and use of photographic lenses
Cameras and shutters
Films and plates
The photography of colored objects
Exposure
Elementary photographic chemistry
Preparing solutions
Darkroom arrangement, conveniences, and practices
Developers and development
The technique of developing roll films, film packs and plates
The science of printing
The practice of printing
The camera in use
Selection and arrangement of the subject
Outdoor photography
Enlarging papers, equipment and devices
How to make enlargements
Finishing photographic prints
Miniature camera photography
Home portraiture
Lighting and posing in portraiture
Indoor photography
Line work and copying
Color photography
Amateur motion picture cameras, equipment and materials
How to make amateur motion pictures.

GRAPHIC PRESENTATION

Five major study courses in this subject are now offered by the Graduate School. The subject has a three-fold purpose; first, training in graphic expression; second, developing draftsmen as designers and supervisors, whether in the architectural or the mechanical fields; third, training in the reading of blue prints and specifications. The cost per course will be $20.00 for each semester. Prerequisite: 15 standard high school units or equivalent.

Special offering to illustrators, renderers and delineators in short cuts and quick methods of casting shadows by either sunlight or artificial light indoors and outdoors.

ARCHITECTURAL DRAWING. - Instructor: Mr. H. A. Magnuson

Mondays and Wednesdays, beginning January 31.
5:30 to 7:30 P.M. (Elementary: Architectural symbols, perspective shadows, pencil technique, lettering

7:30 to 9:30 P.M. (Advanced: Plan studies, exterior designs, rendering

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FREEHAND DRAWING. - Instructor: Mr. H. A. Magnuson

Mondays and Wednesdays, beginning January 31
5:30 to 7:30 P.M. (Elementary: Perspective in nature, illustrator's perspective, lettering, pencil technique
7:30 to 9:30 P.M. (Advanced: Black and white ads, design and composition, color studies, magazine covers, posters.

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MECHANICAL DRAWING. - Mr. E. A. Garlock

Mondays and Fridays, beginning January 31
5:00 to 7:00 P.M. (Elementary mechanical drawing, descriptive geometry,
(advanced mechanical drawing, mechanical systems -
(electrical, heating and ventilation, refrigeration
(and air conditioning, sanitation and plumbing.

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BLUEPRINT READING. - Instructor: Mr. E. A. Garlock

Mondays and Fridays, beginning January 31
5:00 to 7:00 P.M. (Interpretation of symbols, reading dimensions and
(checking, correlation of drawing and specification,
(mechanical requirements, quantitative analysis,
(estimating costs, U.S. Govt. specifications.

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THE PRINCIPLES AND PRACTICE OF GRAPHIC PRESENTATION OF ECONOMIC DATA
Tuesdays and Thursdays, beginning February 1 from 5:00 to 7:00 P.M. Instructor: R. G. Hainsworth.

The course will consist of a general discussion of the major groups of illustrations and their breakdown into the various classes, forms and types. Selection of type of illustration to use in accordance with the data to be visualized graphically. There will be working examples of single scale, time series, frequency, analytical and computation, two and three dimensional, pictorial and statistical maps and charts.

Prevailing and suggestive examples of map and chart standardization will be given.

Suggestions on the preparation of data for graphic presentation.

Adaptation and average cost of the various reproduction processes will be discussed.

The course is given in the hope of securing better visualization and improvement in the selection and construction of the various graphic types. It is intended to be of practical use to those who are interested in the various graphic forms as outlets for economic facts, as well as anyone engaged in the preparation of graphic presentations.

PRACTICAL PUBLIC SPEAKING (one semester) Tuesdays and Thursdays, beginning February 1 at 4:50 P.M. Instructor: Mrs. Esther King.

The Graduate School of this Department has provided advanced classes in English Grammar and Composition and is continuing and enlarging this programme.

There are many government workers who are interested in a simpler non-credit course, such as is covered in the Practical English and Effective Speech course provided by the Better-Speech Institute of America. Many copies of this course have been made available to government workers through the Department Welfare Store, and many requests have been received by the Graduate School to organize a non-credit course, using these texts as a basis. This course will cover pronunciation, vocabulary development, enunciation, fundamental principles of effective oral expression, stage deportment, breathing exercises, practice in impromptu speaking, and practice in reading intelligently and intelligently from script (prepared for radio speaking).

DESCRIPTIVE ENGLISH GRAMMAR (one semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructor: Dr. Susan E. Harman, Associate Professor of English, University of Maryland.

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

APPLIED ENGLISH GRAMMAR (one semester) Thursdays, beginning February 3 at 4:50 P.M. (Fee $6.00) Instructor: Dr. Susan E. Harman, Associate Professor of English, University of Maryland.

Open only to students who have had the regular course in English Grammar.

Application of the principles of grammar to practical writing.

GOVERNMENT CORRESPONDENCE (one semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructor: Mary H. Sanders, in charge General Correspondence Group, Land Acquisition Section, Farm Security Administration.

This work is planned to help those who are engaged in the handling of Government correspondence. The course includes a thorough review of the rules of English grammar and punctuation; a study of sentence structure to effect clear, forceful expression, planning letters with special reference to paragraphing for clearness and emphasis; discussions of problems connected with the preparation of special types of correspondence and Governmental reports.

TENNYSON (one semester) Mondays and Wednesdays, beginning January 31 at 4:50 P.M. Instructor: Dr. Homer C. House, Professor and Chairman of English, University of Maryland.

A study of the poet's themes and technique; with some attention to scientific, industrial, and philosophical movements of the Victorian period.

SEMINAR IN CREATIVE WRITING (one semester) Tuesdays and Thursdays, beginning February 1 at 4:50 P.M. Instructor: Edward M. Barron.

The work in the seminar is devoted to journalistic and creative writing. Detailed analyses are made of trends and current forms of the trade and the feature article, the familiar essay, the short story, the novelette, and the novel as developed in modern publications. The primary concern is with the artistry of words, facility of expression, and the mechanics of the various forms. The student's inclinations in literary work are studied and he is encouraged to develop along the paths where his natural talents lie. The course presupposes a fundamental knowledge of composition and rhetoric.

This is not a lecture course, but a working group.

MEMORANDUM FOR LANGUAGE COURSES

The standard university requirements for language courses is 6 semester hours of 50 minutes each. The courses as now given are 2 semester hour courses of 60 minutes each. The standard requirement may be met by an additional 30 minutes, making the class hours 150 minutes instead of 120 as at present. With this additional 30 minutes, 3 semester credits may be allowed.

ELEMENTARY ITALIAN (first semester) Tuesdays, beginning February 1 from 5 to 7:30 P.M. Instructor: Dr. Nicholas G. Barbella.

This course aims to master the fundamentals of the language, and practice in conversation. Text book used - Joseph L. Russo, Elementary Italian Grammar. Second semester: Reading of Marraro's "Contemporary Italian Short Stories."

ELEMENTARY SCIENTIFIC FRENCH (second semester) Mondays, Wednesdays and Fridays, beginning January 31 from 7:45 to 8:35 A.M. in Room 5610 South Bldg. Instructor: Dr. Harry B. Humphrey.

Instruction in elements of French grammar. Reading and translation of elementary articles from selected scientific texts. This course is designed to prepare beginners for the advanced course in Scientific French.

ADVANCED SCIENTIFIC FRENCH (second semester) Mondays and Wednesdays, beginning January 31 from 4:45 to 6:15 P.M. in Room 5610 South Bldg. Instructor: Dr. Harry B. Humphrey.

ELEMENTARY SPANISH (second semester) Mondays, beginning January 31, from 5:00 to 7:30 P.M. Instructor: Miss Ruberts M. Olds.

This course aims to secure accuracy and facility in the use of the languages by means of drill in pronounciation, grammar, translations, and reading. Reading of less difficult modern prose with practice in composition, diction and conversation.

(A text containing the fundamentals of Spanish grammar will be completed. A reader with selections appropriate to Spain and Spanish-American countries will be used).

ELEMENTARY GERMAN (second semester) Mondays, beginning January 31, from 5 to 7:30 P.M. Instructor: Dr. C. H. Leineweber.

ADVANCED SCIENTIFIC GERMAN (second semester) Fridays, beginning February 4 from 5 to 7:30 P.M. Instructor: Dr. C. H. Leineweber.

ELEMENTARY RUSSIAN (second semester) Wednesdays, beginning February 2 from 5 to 7:30 P.M. Instructor: Dr. C. H. Leineweber.

This course is especially designed to enable the student, after mastering the elements of Russian grammar, to make translations of scientific articles on agricultural subjects. Textbook: Bondar's Simplified Russian Methods.

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TECHNICAL SHORTHAND SPEED WRITING

100 to 150 WORDS PER MINUTE. (one semester) Mondays and Wednesdays, beginning January 31 at 4:45 P.M. Instructor: Clara E. Richter. (Entrance speed to be 100 words per minute).

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed; in addition, supplementary relevant material will be used. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand which they write prior to entering the class. A non-technical entrance examination will be held Saturday, January 29 in Room 1039 South Building, at the rate of 100 words per minute. It is required that each student have an admission card to the examination room which can be obtained from the Graduate School, Room 4090 South Building. All admission cards must be secured prior to date of examination.

130 to 170 WORDS PER MINUTE (one semester) Mondays and Wednesdays, beginning January 31 at 5:45 P.M. Instructor: Clara E. Richter.

This course will be a continuation of the work of the first semester. Several additional technical vocabularies will be taken up. Conference material and a general survey of reporting technique is stressed. Range of speed anticipated is from 130 words per minute to 170 words per minute.

Dr. A. F. Woods
Director, Graduate School
Room 4090 South Building
U. S. D. A.

I wish to register for the following courses:

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(Educational work completed giving schools and degrees:)

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Those who cannot pay full fee in advance must register at office. Upon receipt of fee, registration cards will be mailed.

Present position - Civil Service Status:

_____

Official Address _____ Telephone _____
(Where employed) _____.

I will call at your office and complete registration _____.

Name _____

Home Address _____ Telephone _____

I enclose check or money order for: _____

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GRADUATE SCHOOL
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SUMMER COURSES

In view of the increasing demand for work during the summer, the Graduate School, U. S. Department of Agriculture, is arranging to offer certain courses where requests for them are received sufficiently early to make the necessary arrangements.

The courses so far requested are:

ADVANCED FRENCH. 1st and 2nd semesters (6 hours credit). Beginning date, May 21. Instructor: Dr. H. B. Humphrey.

FUNDAMENTALS OF ECONOMIC THEORY -- VALUE, PRICE AND DISTRIBUTION. One semester, Tuesdays and Thursdays, 5-7 P.M.; June 21 - August 18. (2 hours credit) Instructor: Dr. Max J. Wasserman. Register room 4090 South Building. Fee: $12.00.

This course is designed to give graduate students of economics a solid foundation in those fundamental elements of economic theory which are essential to economic and statistical analyses. The course will first take up the theories underlying the determination of value in use, value in exchange, price, wages, rent, interest, and profits of the leading

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economists of the Classical, Psychological or Austrian, schools. It will then proceed to an analysis of Alfred Marshall's reconciliation of the theoretical positions of these two schools. The course will next take up a critical examination of these theories in the light of recent economic developments. It will be developed that these theories of value and distribution were elaborated to fit economic environment of an earlier type; that is, a laissez-faire economy, and that they are now in need of considerable revision if they are to be adapted to modern economic life. The final part of the course will undertake to develop original theories of value, price and distribution, adapted to the present type of economy.

ENGLISH LITERATURE SINCE 1800. One semester, Tuesdays and Thursdays, 4:30-6:30 P.M.; June 14 - August 18. (3 hours credit) Instructor: Albert S. Kerr. Register room 4090 South Building. Fee: $22.50.

A rapid survey of the main currents in English literature since the Romantic Movement, both poetry and prose, with emphasis on economic, sociological, and philosophical tendencies and their effects on present times. Beginning with Wordsworth, the course will treat the outstanding writers of the Nineteenth Century, to be followed by study of Twentieth-Century developments. Readings, lectures, discussions, and careful analyses of a few important works with some supplemental reading in the novel and the drama.

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UNITED STATES DEPARTMENT OF AGRICULTURE
Office of the Under Secretary

Special Series of Lectures on Democracy
M. L. Wilson, Under Secretary, Chairman

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With reference to the series of lectures on democracy announced in the recent statement of the Graduate School, it will probably be of interest to Department employees to learn of the people who have been invited to give these lectures.

The names of these people, together with the lecture subjects, are as follows:

Feb. 3	Introduction: What Do We Mean By Democracy? - M. L. Wilson
Feb. 10	The Rise of American Civilization - Charles Beard
Feb. 17	The Folklore of Capitalism - Thurman Arnold
Feb. 24	The American Cultural Pattern - Ruth Benedict
March 3	The Organization of Science for Social Ends - Paul B. Sears
March 10	Democracy's Competitors - Arnold Wolfers
March 24	Democracy and Foreign Policy - H. F. Armstrong
~~March 31~~ April 14	Discipline and Democracy - H. A. Wallace
March 31	Straw Polls - George Gallup
April 7	The Nature of Representative Democracy - Sir Willmott Lewis
~~April 14~~	~~The Place of the Political Machine - C. E. Merriam~~
April 21	Due Process of Policy Making - F. P. Miller
April 28	Size and Soundness in a Democracy - Herbert Agar
~~May 5~~ May 17	Social Dynamics and the Legislature - R. L. Buell
May 12	Social Dynamics and the Judiciary - Walton Hamilton
~~May 19~~	~~Social Dynamics and the Executive - Henry Toll~~
~~May 26~~	~~The Drift from Democracy - A. H. Sulzberger~~
~~June 2~~ May 19	The Administrative State - Herman Finer

Acceptances have already been received from Dr. Charles A. Beard, Dr. Ruth Benedict, Dr. George Gallup, Dr. R. L. Buell, and Dr. Herman Finer.

Donald C. Blaisdell

Donald C. Blaisdell,
Assistant to the Under Secretary.

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THE DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

EDUCATIONAL COURSES MAKING FACILITIES AVAILABLE FOR STUDY AND RESEARCH in the GOVERNMENT SERVICE

1938-39

Washington

THE DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WASHINGTON

EDUCATIONAL COURSES FOR 1938-39

Fall semester commences September 19th, 1938.

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The Graduate School of the Department of Agriculture will open the 1938-39 school year the week beginning September 19th. Classes will meet in the Department buildings at 4:45 p.m. or as soon thereafter as the students can assemble. The tuition will be $12 per semester for two hour a week studies and $18 a semester for three hour a week studies, except as otherwise indicated. Those who desire college or graduate credits certified to a university or to the Civil Service Commission will pay $7.50 per credit hour. Students withdrawing from classes after the second week will not be entitled to a cash refund; until the end of the second week, anyone withdrawing from a class is entitled to the return of his fee, minus a $3 charge which is retained as the average per capita expense attached to each registration. An exception is made in the case of students withdrawing from a class that is continued with fewer than fifteen pupils; no refund at all is then granted. But if an announced course is not given for want of the minimum number of students (15), money paid will be returned in full.

REGISTER IN ADVANCE. No one will be admitted to class without a registration card. Registrations must be completed before September 20th to avoid the late fee of $2.

The Congress of the United States has made special provision for making the facilities for study and research in the government departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe (Joint Res. April 12, 1892-27 Stat. 395; Deficiency Act of March 3, 1901-31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act, a School of Graduate Studies was organized with the approval of the Secretary of Agriculture in 1921 for the benefit of Department employees and such others as are qualified to undertake the work offered.

The formal outline of courses is organized on a college basis, and a certificate showing the work accomplished is issued to each student upon request. These certificates are accepted by the Civil Service Commission, and by graduate schools and accredited colleges wherever the work fits into the program of studies approved by such schools. Graduate credit can be obtained only by persons holding a bachelor's degree, undergraduate credit only by those who have been certified from a standard high school or equivalent. Courses meeting two clock hours per week carry two semester credits per semester; those meeting three clock hours per week carry three credits per semester. Courses running through the full year earn double this number, i.e., 4 or 6 semester credits, respectively.

Arrangements are frequently worked out by the Graduate School with approved institutions whereby a candidate for an advanced degree utilizes the facilities of government laboratories, libraries, and collections, in the study of a problem under the supervision of a qualified expert in the government service.

The second type of study is in formal classes and laboratories conducted after working hours in such subjects as will be helpful to government workers. The list of available courses is given on the pages following.

Every effort is made to insure the highest possible standard of work, so that it may be satisfactory to the government service and cooperating colleges. The instructors are selected from the best qualified members of the scientific and professional staffs of the various Bureaus and nearby cooperating colleges. They are, of course, mostly in the Civil Service and hold their positions by reason of merit. Most of them were originally drawn from the staffs of the leading colleges and universities.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is fifteen, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

Special series of lectures not included in this preliminary statement will be announced from time to time as plans for them are completed.

The latest catalogues of universities and colleges are available for consultation in the Office of the Director, room 4090 of the South Building. Inquiries regarding the school should be addressed to

A. F. Woods
Director of the Graduate School, Room 4090
U. S. Department of Agriculture
Washington

ROOM ASSIGNMENTS FOR CLASSES MAY BE OBTAINED FROM THE DIRECTOR'S OFFICE AFTER SEPTEMBER 22d.

ANY STUDENTS WORKING FOR ACADEMIC CREDIT SHOULD SECURE FROM THE SCHOOLS ATTENDED A TRANSCRIPT OF ACADEMIC RECORD AND FILE IT WITH THE SECRETARY AT THE TIME OF REGISTRATION.

INDEX OF COURSES

	Page
Accounting	
Accounting I, Principles of	1
Accounting II, Principles of	1
Accounting, Second Year	1
Accounting, Cost	1
Accounting, Income Tax	1
Accounting in the Field of Legal Problems	2
Mathematics of Finance (see also a more advanced course under mathematics, page 19)	2
Botany	
Botanic Research, History of	3
Botany, Systematic	2
Plant Breeding With Special Reference to Disease Resistance	3
Plant Diseases With Special Reference to Cause and Control	3
Plant Ecology	3
Chemistry	
Inorganic Chemistry, Advanced	4
Organic Chemistry, Advanced	4
Organic Chemistry, An Introduction to	4
Physiological Chemistry	4
Cotton	
Cotton Classing	17
Cotton Marketing	17
Economics	
Agricultural Price Analysis	6
Contemporary Economic Problems	5
Current Social Legislation (see also Law)	7
Economics of Instability	8
Economics, Principles of	5
Foreign Trade Problems and Policies in Relation to Agriculture	7
History of Economic Thought	6
International Trade	7
Money and Banking	7
Political Economy and the Law (see also Law)	7
Social and Economic History of American Agriculture	4
The Development of English Economic and Governmental Institutions	6
English	
Applied English Grammar	9
Descriptive English Grammar	9
Editing Manuscripts on Agriculture, Home Making, and Related Subjects	11
English Literature since 1800	9
Government Correspondence	9

Page

English (continued)
Modern Poets 10
Play Writing and Play Production 10
Practical Public Speaking. 9
Preparation and Presentation of Public Addresses 10
Rural Novel 10
Seminar in Creative Writing 9
The English Novel 10

Extension Seminar 28

Filing Seminar 26

French (see also Languages)
Advanced Scientific French 15
Conversation Seminars in French. 14
Economics in French. 14
Elementary Scientific French. 15

Geography, Introduction to Methods of Quantitative 11

German (see also Languages)
Advanced German. 15
Conversation Seminars in German. 14
Economics in German. 14
Elementary German 15
Technical German 15

Glass Blowing 17

Graphic Presentation
Architectural Drawing, Elementary and Advanced. 12
Blueprint Reading 12
Freehand Drawing, Elementary and Advanced 12
Graphic Presentation of Economic Data, The Principles and Practice of 12
Mechanical Drawing 12
Sketching 12

Italian (see also Languages)
Italian, Advanced 15
Italian, Elementary. 15

Languages (see also French, German, Italian, Russian, and Spanish)
Conversational Seminars in French and German 14
Economics in French and German 14
French, Advanced Scientific 15
French, Elementary Scientific 15
German, Advanced 15
German, Elementary 15
German, Technical 15

Page

Languages (continued)
Italian, Advanced 15
Italian, Elementary. 15
Russian, Elementary. 15
Russian Literature, Lectures on (in English) 15
Spanish, Beginning 15
Spanish Conversation and Composition 15

Law
A Seminar Course on the Current Decisions of the Supreme Court . 26
Current Social Legislation (see also Economics) 7
Labor Law 13
Patent Law and Procedure 26
Political Economy and the Law (see also Economics) 7

Mathematics (see also Statistics)
Advanced Calculus 19
Algebra 18
Calculus 18
Higher Algebra 18
Trigonometry and Geometry. 18
Linear Algebra 19
Mathematics of Investment. 19
The Calculus of Finite Differences. 18
Theory of Functions. 19
Theory of Infinite Processes. 19

Mineralogy, Determinative 16

Philosophy, History of 25

Photography, Basic 13

Psychology
General Psychology 24
Rural Social Psychology, Advanced (see special announcement) . . 24
Social Psychology 25

Radio Engineering 16

Russian (see also Languages)
Russian, Elementary 15
Russian Literature, Lectures on (in English) 15

Spanish (see also Languages)
Spanish, Beginning 15
Spanish Conversation and Composition 15

Sociology
Current Social Problems 25
Labor Problems and Programs 13
Principles of Rural-Urban Sociology 24

Page

Soils: Their Morphology, Genesis and Classification 16

Statistics (see also Mathematics)
- Adjustment of Observations 22
- Analytic Curve Fitting 22
- Correlation Analysis 21
- Dynamic Analysis of Time Series. 23
- Index Numbers and Time Series Analysis 21
- Introduction to Statistical Analysis I 20
- Introduction to Statistical Analysis II 20
- Least Squares 22
- Multivariate Analysis 22
- Seminar in Statistics. 20
- Special Topics in Statistics. 23
- Statistical Treatment of Experiments in the Plant and Animal Industries. 21
- Statistics for Biological Workers 21
- Statistics Laboratory 20
- The Interpretation of Statistical Calculations. 21
- Theory and Application of the Characteristic Function 23

Stenography
- Stenography in German, French, Dutch, Spanish, and Italian. . . 24
- Technical Shorthand Speed Writing, 100-150, 130-170 24

Survey of Public Personnel Management and Supervision 26

General Lectures 27

Publications of The Graduate School 28

Registration Form 29

General Information . . . . . i-ii

DETAILED DESCRIPTION OF COURSES

The asterisk (*) indicates cooperation with American University.

ACCOUNTING

PRINCIPLES OF ACCOUNTING (I) - Dr. Oswald Nielsen, Dr. R. I. Robinson, Messrs. Wm. H. Rowe, and Geo. Y. Jarvis; Mon. and Wed. at 5 commencing Sept. 26th., also Tues. and Thurs. at 5 commencing Sept. 27th. Offered also the 2d semester. (4-6 cr.)

First semester. Elementary principles and procedures of accounting; discussion and problems. At the end of the semester the student will be prepared to devise the accounting records necessary for a small business organization, make the necessary entries in the records, draw off statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester. More advanced principles of accounting; determination of income under special circumstances; the valuation of assets and depreciation policies, manufacturing accounts, partnership accounts, and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

A two hour LABORATORY PERIOD once a week is required for students taking the course for credit unless specially excused by the instructor in which event only four hours credit will be given for the course.

PRINCIPLES OF ACCOUNTING (II) - Second semester of the preceding course. If there is a sufficient number of applicants to form a class in the fall, special arrangements will be made to give the second semester of this course beginning Sept. 27th, Tues. and Thurs. at 5. (2-3 cr.)

* SECOND YEAR ACCOUNTING (II) - Dr. Oswald Nielsen; Thurs. from 5 to 7:30 commencing Sept. 29th. (6 cr.)

First semester. This course will deal largely with valuation, principles governing the valuation of various types of assets, suitable methods of reflecting asset values in the accounts, fundamentals of determining the liabilities and net worth, and the allocation of income and expense to the proper fiscal period as part of the problem of valuation. The discussion of profits will include a consideration of the problems pertaining to the deferring of expenses and the treatment of unusual losses and gains. The appropriation of profits for dividends and reserves and the relationship of funds to reserves will also be examined.

Second semester. Content of course to be announced in the January bulletin.

Prerequisite: First year accounting, or its equivalent.

* COST ACCOUNTING (For details see the catalog of American University, School of Public Affairs).

* INCOME TAX ACCOUNTING (as above).

MATHEMATICS OF FINANCE (II) - Mr. Wm. H. Rowe; 2d sem, only. (2-3 cr.) Calculation of compound interest, compound discount, sum of annuities, present value of annuities and perpetuities; determination of annual payments necessary to accumulate sinking funds and to amortize debts by installments and preparation of schedules for such accumulations and amortizations. The valuation of bonds in cases where the yield rate differs from the bond rate and the preparation of schedules for the amortization of premiums or accumulations of discounts on such bonds. Computation of depreciation by the sinking fund method, the fixed percentage of book value method, and other methods, as well as the preparation of schedules for the same will be included. Some study will be given to life probabilities, and the computation of premiums for the simpler types of life annuities and life insurance.

This course is given primarily for students of accounting, but others will be admitted to the course. The application to accounting will be reserved until the last third of the semester. For students not taking the accounting applications the course will be for ten weeks with two hours credit; for accounting students the course will continue five additional weeks and give three hours credit. Problems will include those of types given in C.P.A. examinations.

Prerequisites: Algebra; and for students taking the three hour course, one year of accounting. (See also a more advanced course under Mathematics.)

ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (V) - Dr. Mark S. Massel; Tues. and Thurs. at 5 commencing Sept. 27th. (6 cr.)

This course is designed to present significant accounting concepts in the field of legal problems. It will include a general exposition of accounting methods in correlation with pertinent legislation by use of the case method.

Purposive character of accounting: balance sheets, assets, liabilities, capital. Income and profit and loss statements. Reserves and deferred assets. Aspects of fraud, taxation and public utility regulation.

Cost accounting methods; labor, material, and overhead. Accounting problems in trade regulation: legislative and administrative regulation, including prohibitions against sales below cost, loss-leader limitations, and the Robinson-Patman anti-discrimination act. Legal procedures: criminal sanctions, cease and desist orders, civil suits, arbitration.

Prerequisite: Two years of law, or permission of the instructor.

BOTANY

SYSTEMATIC BOTANY (II) - Dr. S. F. Blake; Mon. and Wed. at 4:50 commencing Sept. 26th. (4 cr.)

The course is intended to given those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The first semester will be devoted to lectures on the general principles and classification and the principal families of flowering plants, illustrated by herbarium specimens. The parts of the plant and of the flower are studied. The principles of botanical nomenclature are discussed and some of the more important floras and nomographs examined. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

PLANT ECOLOGY (IV,V) - Dr. M. B. Waite; Mon., Wed., and Fri. at 4:50 commencing Oct. 3d. (6 cr.)

First semester. General plant ecology. The general principles of plant ecology, including the soil, climatic, and biotic factors influencing the principal native plant formations of the United States and the principal crop-plant regions. The ecology of cultivated crop plants will be stressed. The viewpoint of plant ecology, methods of study, and observation bearing on problems in botany and phytotechny will be developed.

Second semester. The ecological factors will be discussed in relation to the non-parasitic, the virus, and the parasitic diseases of plants. The ecology of insect transmission of diseases will be considered. The ecology in health and disease of the leading crop plants will form a major part of the course.

Prerequisites: A general knowledge of botany and of agriculture.

PLANT DISEASES WITH SPECIAL REFERENCE TO CAUSE AND CONTROL (IV,V) - Dr. M. B. Waite; Mon., Wed., and Fri. at 4:50 commencing Oct. 3d. (6 cr.)

This course is expected to alternate with Ecology. If there is a greater demand for this course it may be substituted for Plant Ecology.

PLANT BREEDING WITH SPECIAL REFERENCE TO DISEASE RESISTANCE (V) - Dr. F. J. Stevenson, assisted by other specialists; not given until 1939-40.

Prerequisite: B.S. degree in botany or related subject.

HISTORY OF BOTANIC RESEARCH (IV,V) - Dr. O. F. Cook; Tues. and Thurs. at 4:45 commencing Sept. 27th. (4 cr.)

A general survey of human interest in the plants of the world. Ancient and modern knowledge of plants and their uses as food, shelter, clothing, medicines, flowers, and industrial raw materials. Centers of domestication and primitive systems of agriculture, "milpa" farming in temporary clearings, tillage, terracing and irrigation in prehistoric times and in tropical countries. Origins and histories of cultivated plants in relation to development of civilization, including recent domestications and introductions to new regions. Effects of agriculture on native vegetation, and eventual limitation or extinction of advanced races by deforestation, denudation, and erosion of cultivated areas and "waste" lands. Methods and results of botanic study in the scientific period. Special research courses in historic treatment of biologic problems of the plant world may be arranged for advanced students working in libraries, collections, or laboratories, on approval of training, experience, subjects and plans of investigation, for theses or other publications.

CHEMISTRY

AN INTRODUCTION TO ORGANIC CHEMISTRY (II) - Dr. E. P. Clark; Tues. and Thurs. at 4:50 commencing Sept. 27th. (4 cr.)

This course will consist of a series of lectures covering the fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

ADVANCED ORGANIC CHEMISTRY (IV,V) - Dr. W. Gordon Rose; Tues. and Thurs. at 4:50 commencing Sept. 27th. (4 cr.)

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins, and sex hormones will be given.

Prerequisites: A year of organic chemistry and a year of physics.

INORGANIC CHEMISTRY, ADVANCED (IV,V) - Dr. James I. Hoffman; not given until 1939-40. (4 cr.)

PHYSIOLOGICAL CHEMISTRY (IV,V) - Dr. Herbert O. Calvery; Tues. and Thurs. from 8 to 9 a.m. commencing Sept. 27th. (Another hour to be arranged if morning hour not satisfactory). (4 cr.)

First semester. A lecture course on the elementary principles of biochemistry. The course will deal with the chemistry of the proteins, fats, and carbohydrates; the general chemical composition of animal tissues, e.g. muscle, nerve, milk, and blood; a brief discussion of the enzymes of the gastro-intestinal tract; and finally, the digestion and absorption of the principal foodstuffs.

Second semester. This will be a continuation of the first semester and will include discussion of the metabolism of the proteins, fats, and carbohydrates, as well as mineral metabolism; the chemical constituents of the urine; and finally, a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

Prerequisites: One year general chemistry; one year organic.

ECONOMICS

* SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (I) - Mr. Everett E. Edwards; Tues. and Thurs. at 4:50 commencing Sept. 27th. (4 cr.)

First semester. Geographic factors; settlement of the English colonies along the Atlantic Coast; indigenous and foreign contributions to American agriculture; Indian agriculture and Indian influence on agrarian immigration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the American Civil War; agriculture during the same period; transportation facilities and home and foreign markets; farmers and political

* SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE -- continued. activity to the American Civil War; agriculture's relation to the sectional struggle.

Second semester. Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, agricultural education, State and Federal departments; agriculture since 1860 by regions and commodities; American agriculture during the World War; the cooperative movement, rural population and tenancy changes and tendencies.

No prerequisites.

* CONTEMPORARY ECONOMIC PROBLEMS (II) - Dr. Max J. Wasserman; Tues. and Thurs. at 5 commencing Sept. 27th. (4 cr.)

This course will discuss the theoretical and practical aspects of the major economic problems confronting us at the present time. It will attempt to place each problem in its historical setting showing how it takes its roots in the past developments of economic society; to analyze the economic principles involved in the problem; to evaluate critically the various solutions proposed; and to suggest possible means of its solution. Among the problems which will be treated in the course the following may be cited;

I. Capitalism, its improvement and substitute economic organizations
   - A. Necessary reforms in the structural organization of capitalism
   - B. Substitute forms of economic organization: Socialism, Communism, and Fascism

II. Selected labor problems
   - A. The problem of unemployment
   - B. Wages and hours
   - C. Social Insurance and Social Security

III. Selected problems in fields of money, banking and credit
   - A. The control of price levels
   - B. The control of business cycles through banking regulations
   - C. Monetary and credit inflation

IV. Selected agricultural problems
   - A. The problem of agriculture price levels
   - B. Land use problems
   - C. The sub-marginal farmers including tenancy questions

V. The federal regulation of business

Note: Should other specific questions interest sufficient members of the class, they will be included in the year's discussion. The course will begin with a brief background discussion, tracing the present trends and the development of modern economic society and showing the important economic problems which develop as institutions change.

PRINCIPLES OF ECONOMICS (II) - Dr. E. W. Braun; Mon. and Wed. at 5 commencing Sept. 26th. (4 cr.)

This course is designed to serve students who wish a foundation for advanced economic theory, and students who wish to link quantitative analysis with economic principles. Emphasis will be placed upon the relation between

PRINCIPLES OF ECONOMICS -- continued.
economic principles and tendencies and frequency distributions, and time series including index numbers. The first semester will be devoted to questions relating to value. Illustrative material will be drawn mainly from agricultural economics, and the second semester will be devoted to a treatment of distribution of income and other subjects, such as money and banking, business cycles, and institutional economics, depending upon the available time and desires of the students.

THE DEVELOPMENT OF ENGLISH ECONOMIC AND GOVERNMENTAL INSTITUTIONS (II,III Dr. W. L. Slifer; Tues. and Thurs. at 5 commencing Sept. 27th. (4 cr.)

This course gives a background for training in the social sciences. The origin and development of economic and governmental institutions by our English ancestors are presented. The changes in the methods used by the people in earning their livelihood from the early days of English history to the present are stressed throughout the course. This includes the various phases of agriculture, commerce, and industry. Special attention is given to the early guilds, fairs, and markets. The development of foreign trade, the industrial revolution, and modern industry are described. The great landmarks, such as the Magna Charta, the Petition of Rights, and the Bill of Rights, are analyzed to give the proper background for an understanding of the American Constitution.

* AGRICULTURAL PRICE ANALYSIS (IV) - Dr. F. L. Thomsen; Mon. and Fri. at 4:50 commencing Sept. 26th, first semester only. (2 cr.)

Time elements in prices. Research methods and materials in price analysis. Index numbers. Uses and limitations of multiple correlation in price analysis. Seasonal variation. Trends and cycles. A critical evaluation of progress to date in price analysis. Price forecasting; chart reading; relation between cash and future prices. Factors affecting and methods of forecasting prices of the principal agricultural products.

Prerequisites: At least one course in statistical methods, and a course in Prices and Price Relationships, or its equivalent.

HISTORY OF ECONOMIC THOUGHT (IV,V) - Dr. Max J. Wasserman; Mon. and Wed. at 5 commencing Sept. 26th. (4 cr.)

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions and customs and practices which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresme. The Mercantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Riviere. The Classical School; Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill. The Socialists: LaSalle, Marx, Proudhon. The German Historical School: Knies, Hillebrand, Wagner. The Austrian School: Von Wieser, Bohm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments -- institutional, quantitative, and welfare economics.

Prerequisites: Major in social sciences, or the consent of the instructor.

MONEY AND BANKING (IV,V) - Dr. Max J. Wasserman; Fri. from 7 to 9 p.m. commencing Sept. 30th. (4 cr.)

Money - medium of exchange, functions of money, history of the United States coinage, paper money, the money system of the United States, value of money and prices, credit. Banking - origin and development of banking, banking development in the United States, functions of the bank, national banking system, administration, deposits and depositors, clearing house, domestic and foreign exchange, loans and discounts, bank supervision, savings banks, trust companies, foreign banking systems, defects of national banking systems, Federal Reserve system, the Agricultural Credit system.

Prerequisites: Major in economics, or consent of the instructor.

* CURRENT SOCIAL LEGISLATION (IV,V) - Mr. Glen Leet; 2d sem. only. (3 cr.)

The field covered will include social legislation currently under Congressional consideration and will include social security, old age insurance, unemployment compensation, public assistance, health insurance; child welfare; unemployment and relief; public health, child and maternal health, venereal disease control, cancer control.

This course will be conducted on a seminar basis with a limited enrollment. There will be occasional guests present with special knowledge of particular problems considered. Reports of hearings before Congressional committees and reports of executive agencies will be used extensively as source material.

* FOREIGN TRADE PROBLEMS AND POLICIES IN RELATION TO AGRICULTURE (IV,V) - Mr. L. A. Wheeler; Mon. and Wed. at 4:50 commencing Sept. 26th. (4 cr.)

The object of this course is to present for discussion and analysis certain fundamental aspects of the foreign trade trends and policies of the United States and of the agricultural policies of foreign countries as they relate to American agriculture. One or two lectures on international trade theory will be given and selected readings assigned early in the course to provide a general background. The course is intended primarily for graduate students who have already some training in theory.

INTERNATIONAL TRADE (IV,V) - Drs. James P. Cavin and Bennett S. White; Fri. from 5 to 7 p.m. commencing Sept. 30th. (4 cr.)

Recent developments in international trade theory; realistic approach to the doctrine of comparative advantage in interregional and international exchange. Mechanism and theory of international trade; past and contemporary experience; trade developments in the future.

Prerequisites: An undergraduate major in economics, or the consent of the instructors.

POLITICAL ECONOMY AND THE LAW (V) - Dr. Joseph G. Blandi of the Johns Hopkins University; Wed. and Fri. at 5 commencing Sept. 28th. (4 cr.)

This course will embrace a discussion of the traditional view of the isolation of the law. It will point out the gradual change in this tradition and the persistent demand for coordination of the law with economics. It will analyze the scientific status of economics, and make plain its psychological promise and the element of explanation. The meaning of property from the point of view of quality and relation will be compared and distinguished. The legal and economic theories of property, such as the occupation and labor

POLITICAL ECONOMY AND THE LAW -- continued.

theories as well as the Hegolian principles, the higher Law doctrine, will be critically studied, and it will bring forth to light the functional theory - the concept of property based upon its social utility, namely, the justification and distribution of property; the influence of class bias of unemployment, wages, hours of labor, collective bargaining, industrial insurance, and social security will be taken notice of throughout this discussion. No statement will be made without its support by competent and well-recognized authorities. The views of law and economics of the Chief Justice and other eminent justices of the Supreme Court, embodied in their opinions, will constitute the main theme of this course. Numerous Supreme Court cases and the economic aspects involved in them will be discussed and analyzed. Among the decisions of the Supreme Court will be included the most recent adjudicated cases. The course will conclude with a lecture on law and economics in the light of the Mosaic and ancient Legislation.

The course will be conducted in an informal manner. Students will be assigned definite reading of authorities dealing with our subject. On the basis of this reading, the discussion will proceed by the members of the class led by the lecturer. The students will be required to familiarize themselves with the contents of the United States Constitution which will permeate this course.

* ECONOMICS OF INSTABILITY (V) - Dr. Mordecai Ezekiel and Mr. Louis H. Bean; Mon. and Wed. at 4:45 commencing Sept. 26th. 1st sem. only. (2 cr.)

1. A consideration of the types of instability present in the economic system as a whole, including both business cycles, major depressions, and cycles of individual industries. 2. A critical examination of the law of supply and demand with reference to the development of the theory of economic cycles under the normal operation of the law and with the expected behavior of industries of various production response and various types of business organization, an examination of the theory of monopolistic competition, and a comparison of this with previous economic theory. 3. An examination of a number of industries with reference to the existence of continuous instability or cycles in the various industries in the light of the theoretical principles developed, including agricultural industries such as hogs, cattle, sheep, and cotton, and non-agricultural industries such as automobiles, steel, cement, commercial and residential construction, etc. 4. A consideration of general instability in the economic structure, including financial policy, savings, and changes in the proportion of wage earnings to profits and dividends. 5. A consideration of cycles of instability in industry as a whole in relation to instability in various individual industries and to general causes of economic instability.

Prerequisites: An M.A. degree in economics plus statistics and courses in statistical price analysis.

See also Economics in French

and German, p. 14.

ENGLISH

PRACTICAL PUBLIC SPEAKING (I) - Esther King; Tues. and Thurs. at 5 commencing Oct. 4th. (2 cr.)

This course will cover pronunciation, vocabulary development, enunciation, fundamental principles of effective oral expression, stage deportment, breathing exercises, practice in impromptu speaking, and practice in reading intelligibly from script prepared for radio speaking.

GOVERNMENT CORRESPONDENCE (II)- Mary H. Sanders; Tues. and Thurs. at 4:50 commencing Sept. 27th. A one sem. course given both sems. (2 cr.)

This work is planned to help those who are engaged in the handling of government correspondence. The course includes a thorough review of the rules of English grammar and punctuation; a study of sentence structure to effect clear, forceful expression; planning letters with special reference to paragraphing for clearness and emphasis; discussions of problems connected with the preparation of special types of correspondence and governmental reports.

DESCRIPTIVE ENGLISH GRAMMAR (II) - Dr. Susan E. Harman; Mon. and Wed. at 4:50 commencing Oct. 3d. A one sem. course given both sems. (2 cr.)

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

APPLIED ENGLISH GRAMMAR (II) - Dr. Susan E. Harman; 2d sem. (1 cr.)

Open only to students who have had the course in English grammar. Application of the principles of grammar to practical writing.

SEMINAR IN CREATIVE WRITING (II) - Mr. Edward M. Barron; Tues. and Thurs. at 4:50 commencing Sept. 27th. A one sem. course given both sems.(2 cr.)

The work in the seminar is devoted to journalistic and creative writing. Detailed analyses are made of trends and current forms of the trade and the feature article, the familiar essay, the short story, the novelette, and the novel as developed in modern publications. The primary concern is with the artistry of words, facility of expression, and the mechanics of the various forms, The student's inclinations in literary work are studied and he is encouraged to develop along the paths where his natural talents lie. The course presupposes a fundamental knowledge of composition and rhetoric.

ENGLISH LITERATURE SINCE 1800 (IV,V) - Mr. Albert S. Kerr; Tues. and Thurs. at 4:50 commencing Sept. 27th. (4 cr.)

A rapid survey of the main currents in English literature since the Romantic Movement, both poetry and prose, with emphasis on economic, sociological, and philosophical tendencies and their effects on present times. Beginning with Wordsworth, the course will treat the outstanding writers of the Nineteenth Century, to be followed by study of twentieth century developments. Readings, lectures, discussions, and careful analyses of a few important works with some supplemental reading in the novel and the drama.

THE ENGLISH NOVEL (IV,V) - Mr. Albert S. Kerr; Mon. and Wed. at 4:50 commencing Sept. 26th. (4 cr.)

First semester. The course will begin with discussions of the purposes of novel reading and novel writing. After a brief survey of the early forms of fiction, the epistolary and picaresque traditions of the eighteenth century (Richardson, Fielding, Smollett, Sterne) will be followed by the novels showing the influence of the Romantic Revival (the Gothic Novel) and of the French Revolution. The rise of realism and of the "novel with a purpose" will be traced through the work of the earlier Victorians.

Second semester. Beginning with the late Victorians, Hardy and Meredith, the course will treat developments during the last sixty years, particularly the extension of the realistic method under the influence of Continental writers and the new psychology.

The emphasis throughout will be upon content, philosophical, political, economic, religious, and sociological, but significant changes in technique will be noted, along with the effects of changing modes of publication and distribution. The course will be conducted in lectures and discussions, with rapid reading of numbers of novels. Text recommended: Pelham Edgar, The Art of the Novel, College Edition, (Macmillan, 1933).

MODERN POETS (IV,V) - Dr. Homer C. House; Mon. and Wed. at 4:50 commencing Sept. 26th. (6 cr.)

Lectures on American and English poets of the late nineteenth and the twentieth centuries. Class readings with a study of the art and philosophy of selected poets. First semester - American poets; second semester - English poets.

RURAL NOVEL (IV,V) - Miss Caroline B. Sherman; Fri. from 5 until 7 p.m. commencing Sept. 30th. (2 cr.)

Reading and discussion chiefly, with occasional lectures. Will review the development of rural fiction in America giving some attention to the times and tracing the characteristics of each decade; will scrutinize the adequacy of our later rural fiction by applying such tests as timeliness, regional influences, social and economic influences, besides the tests usually applied in studying a literature.

PREPARATION AND PRESENTATION OF PUBLIC ADDRESSES (IV,V) - Mr. Knute E. Carlson; Fri. from 5 to 7 commencing Sept. 30th. (2 cr.)

This course will give special attention to collection, organization, and logical presentation of subject matter with various definite objectives in view.

Prerequisites: Basic public speaking, or its equivalent.

PLAY WRITING AND PLAY PRODUCTION (IV,V) - Miss Rebecca Dial; Tues. and Fri. at 5 commencing Sept. 27th. (4 cr.)

First semester. Play writing - technique of writing a one-act play, selecting the plot germ, development of plot, characterization, dialogue and preparation of manuscript for the producer. Criticism of scripts.

Second semester. Play production - selecting, casting and technique of producing short scenes or play of one act.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (IV,V) - Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information, Dept. of Agriculture; Mon., Wed. and Fri. at 4:50 commencing Sept. 26th. (3 cr.) Registration is limited to 40 students.

This course is intended primarily for those seeking information on the editorial technique involved in handling manuscripts after they leave the authors' hands and until they are issued in printed form. Discussion of the fundamental principles of editing, including the organization or re-arrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; considerations governing titles, tables of contents, headings, footnotes, illustrations, literature citations and bibliographies, and statistical checking; the principles of table formation and arrangement; typography and the relation of type to subject matter; and the fundamentals of indexing and proof reading. Practical examples of editorial work will be discussed in class. Opportunity for some familiarity with the Style Manual of the Government Printing Office will be provided. Collateral reading will be indicated. Those desiring credit for the course will be required to pass a written examination at the end of the semester.

GEOGRAPHY

* INTRODUCTION TO METHODS OF QUANTITATIVE GEOGRAPHY (IV,V) - Dr. John Kerr Rose; Tues. and Thurs. at 4:50 commencing Sept. 27th. (4 cr.)

Several important sections of the field of geography will be surveyed, including population distribution, agricultural geography, land utilization and climatology. The general approach will be that of recognition and definition of problems that seem to lend themselves to study by quantitative techniques; survey of quantitative contributions that have been made thereto, and consideration of the utility and limitations of such statistical methods as might advantageously be used.

Specific application and utility of descriptive statistics, correlation and sampling techniques will be emphasized. Particular attention will be given to areal indices and to measures of distribution and relationship (association) applied to data having spatial distribution.

An acquaintance with the field of geography and a working knowledge of statistics are both highly desirable for the prospective student, though the course as given will not presume any extensive knowledge of either field and the statistical techniques used will be introduced and taught as needed.

GRAPHIC PRESENTATION

These subjects have a three-fold purpose: First, training in graphic expression; second, developing draftsmen as designers and supervisors, whether in the architectural or the mechanical fields; third, training in the reading of blueprints and specifications. The cost per course will be $20.00 a semester, unless otherwise stated. Prerequisite: 15 standard high school units or equivalent.

* THE PRINCIPLES AND PRACTICE OF GRAPHIC PRESENTATION OF ECONOMIC DATA (IV,V) - Mr. R. G. Hainsworth; Tues. and Thurs. at 4:50 commencing Sept. 27th. (4 cr.)

The course will consist of a general discussion of the major groups of illustrations and their breakdown into the various classes, forms, and types. Selection of type of illustration to use in accordance with the data to be visualized graphically. There will be working examples of time series and frequency in two and three dimension; pictorial and statistical maps and charts. Prevailing and suggestive examples of map and chart standardization; suggestions on the preparation of data for graphic presentation; adaptation and average cost of the various reproduction processes.

ARCHITECTURAL DRAWING (II) - Mr. H. A. Magnuson; Mon. and Wed. from 4:50 to 6:50 commencing Sept. 26th. (4 cr.)

Elementary: Architectural symbols, perspective shadows, pencil technique, lettering.

Advanced: Plan studies, exterior designs, rendering.

FREEHAND DRAWING (I,II) - Mr. H. A. Magnuson; Mon. and Wed. from 7 to 9 p.m. commencing Sept. 26th. (4 cr.)

Elementary: Perspective in nature, illustrator's perspective, lettering, pencil technique.

Advanced: Black and white ads, design and composition, color studies, magazine covers, posters.

SKETCHING (I,II) - Mr. H. A. Magnuson; Tues. from 5 to 7 commencing Sept. 27th. (2 cr.) Fee: $10.00 a semester.

All renderings will be executed in pencil only. Studies will be made in selecting the subject, composing the picture, and in what not to render for an effective reproduction.

MECHANICAL DRAWING (I,II) - Mr. E. A. Garlock; Tues. and Thurs. from 4:50 to 6:50 commencing Sept. 27th. (4 cr.)

Elementary mechanical drawing; descriptive geometry; advanced mechanical drawing, heating and ventilation, refrigeration and air conditioning, sanitation and plumbing.

BLUEPRINT READING (I,II) - Mr. E. A. Garlock; Tues. and Thurs. from 7 to 9 p.m. commencing Sept. 27th. (4 cr.)

Interpretation of symbols, reading dimensions and checking, correlation of drawing and specification, mechanical requirements, quantitative analysis, estimating costs, Government specifications.

BASIC PHOTOGRAPHY (III,IV) - Mr. Carl H. Hanson and other specialists; Mon. and Wed. at 4:50 commencing Oct. 3d. 1st sem. only. (2 cr.)

There are no prerequisites. The course will be elementary and basic in character and will be designed to meet the needs of the amateur. Text: Air Corps Training Manual No. 2170-5, "Basic Photography," for sale by the Superintendent of Documents - price 65 cents.

Tentative outline of the course:

Elementary photographic optics
Selection and use of photographic lenses
Cameras and shutters
Films and plates
The photography of colored objects
Exposure
Elementary photographic chemistry
Preparing solutions
Darkroom arrangement, conveniences, and practices
Developers and development
The technique of developing roll films, film packs and plates
The science of printing
The practice of printing
The camera in use
Selection and arrangement of the subject
Outdoor photography
Enlarging papers, equipment and devices
How to make enlargements
Finishing photographic prints
Miniature camera photography
Home portraiture
Lighting and posing in portraiture
Indoor photography
Line work and copying
Color photography
Amateur motion picture cameras, equipment and materials

* LABOR LAW (IV,V) - Dr. David Ziskind; Tues. and Thurs. at 4:50 commencing Sept. 27th. (6 cr.)

This course is designed to develop an understanding of the functioning of law and government agencies in the field of labor relations. It will present an analysis of court actions and judicial decisions on labor organizations and collective bargaining, strikes and lockouts, picketing, boycotts and blacklists. It will also survey the progress of legislation on child and woman labor, convict labor, maximum hours, minimum wages, unemployment compensation, old age pensions, industrial accident and sickness insurance, conciliation and arbitration. Particular attention will be paid to the problems and responsibilities of government agencies under the National Labor Relations Act, the Social Security Act, the Railway Labor Act, the Wagner-Peyser Act, the Public Contracts Act, the Emergency Relief Appropriation Acts, and the District Minimum Wage Law.

(Dr. Ziskind succeeds the late Dr. Berman in charge of this and the following course.)

LABOR PROBLEMS AND PROGRAMS (IV,V) - Dr. David Ziskind; Mon. and Wed. at 4:50 commencing Sept. 26th. (6 cr.)

The purpose of this course is to present the problems of labor and the remedial efforts of the employees, the employers and the government. The content of the problems to be considered may be indicated by the following subjects: wages, rates, income, standards of living, regional differentials, methods of payment, deductions; hours, overtime, speed-up; employment

LABOR PROBLEMS AND PROGRAMS -- continued.
opportunity, social ladder, creative development, race discrimination; unemployment, turn-over, displacement, lay-off, rotation; occupational hazards, accidents, sickness; sub-standard workers, handicapped, superannuated, apprentices, women, children, convicts, casuals.

The programs to be studied are those proposed by the following institutions: the employee organizations (Knights of Labor, A.F. of L., I.W.W., Railroad Brotherhoods, Company Unions, C.I.O., Workers' Alliance, Independents); employers associations (National Association of Manufacturers, National Industrial Conference Board, League for Industrial Rights, National Civic Federation, Chambers of Commerce, Service Clubs, Trade Associations); government agencies (Federal - Departments of Labor, Commerce, Agriculture, N. L. R. B., S. S. B., National Mediation Board, Maritime Commission, Railroad Retirement Board; State - Employment Services, Industrial Accident Commissions, Wage Collection Agencies, Unemployment Compensation Boards).

LANGUAGES

The standard university requirement for language courses is six semester hours of fifty minutes each. The courses as now given are two semester hours of sixty minutes each. The standard requirements may be met by an additional thirty minutes per week. Those desiring the three semester credits must register for them in advance paying $18 a semester instead of $12.

ECONOMICS IN FRENCH AND GERMAN (V) - Dr. Walter Bauer; Thurs. at 4:50 commencing Oct. 6th. (4 cr.)

Designed to aid students in securing their language requirements for the Doctorate in Economics; to review in the original, contributions to economic thought.

Plan of Course: The principal contributions to economic thought made by German and French economists will be discussed in German and French. Salient portions of their publications, made available in mimeographed form, will be translated and analyzed in class with a view to coining the proper English equivalents of terms and economic conceptions used by foreign economists.

Prerequisites: Advanced or scientific French and German; Bachelor's degree; graduate program majoring in Economics.

CONVERSATIONAL SEMINARS IN FRENCH AND GERMAN (III) - Miss Mary Sabarth; Tues. and Thurs. at 4:50 commencing Oct. 4th. (4 cr.) Groups limited to fifteen.

These seminars are designed to give facility in conversation, use of idiom and correct pronunciation, development of vocabulary in social and business contacts that must be made in foreign countries by those traveling or stationed there. (Miss Sabarth has had many years of residence and teaching experience in foreign countries and in America, especially at Roberts College in Constantinople, schools in Berlin, and at Barnard College of Columbia.)

Prerequisite: A good reading knowledge of French and German.

* ELEMENTARY SCIENTIFIC FRENCH (I,II) - Dr. Harry B. Humphrey; Mon. and Wed. at 4:45 commencing Sept. 26th. (4-6 cr.)

Instruction in elements of French grammar. Reading and translation of elementary articles from selected scientific texts. This course is designed to prepare beginners for the advanced course in Scientific French.

ADVANCED SCIENTIFIC FRENCH (III,IV) - Dr. Harry B. Humphrey; Tues. and Thurs. at 4:45 commencing Sept. 27th. (4-6 cr.)

* ELEMENTARY GERMAN (I) - Dr. C. H. Leineweber; Mon. from 5 to 7:30 commencing Sept. 26th. (4-6 cr.)

ADVANCED GERMAN (III) - Dr. C. H. Leineweber; Tues. from 5 to 6:45 commencing Sept. 27th. (4 cr.)

Knowledge of German required. Text: Goethe's Faust.

TECHNICAL GERMAN (III) - Dr. C. H. Leineweber; Wed. from 5 to 7:30 commencing Sept. 30th. (4-6 cr.)

ELEMENTARY RUSSIAN (I) - Dr. C. H. Leineweber; Wed. from 5 to 7:30 commencing Sept. 28th. (4-6 cr.)

LECTURES ON RUSSIAN LITERATURE (III) - Thurs. from 5 to 6 commencing Sept. 29th. (2 cr.) Fee $6 a semester.

These lectures will cover the lives and the works of the most important writers in Russian literature and will be delivered in English. No knowledge of Russian required.

* BEGINNING SPANISH (I) - Miss Ruberta M. Olds; Mon. from 5 to 7:30 commencing Sept. 26th. (4-6 cr.)

The aim of this course is to secure accuracy and facility in the use of the language by means of drill in pronunciation, conversation, grammar and reading. Texts - A good basic grammar, a reader called A México por Automóvil, and maps of Spanish-American countries.

* SPANISH CONVERSATION AND COMPOSITION (II,III) - Miss Ruberta M. Olds; Wed. from 5 to 7:30 commencing Sept. 28th. (4-6 cr.)

The aim of the course will be to develop ability to understand and to converse in simple, idiomatic Spanish, to translate articles in newspapers and magazines, and to compose and translate ordinary business and social letters, and to read for enjoyment.

Prerequisites: Beginning Spanish, or its equivalent.

* ELEMENTARY ITALIAN (I,II) - Dr. Nicholas G. Barbella; Tues. from 5 to 7:30 commencing Sept. 27th. (4-6 cr.)

This course aims to master the fundamentals of the language and practice in conversation. Texts: Joseph L. Russo, Elementary Italian Grammar; Marro, Contemporary Italian Short Stories.

ADVANCED ITALIAN (III,IV) - Dr. Nicholas G. Barbella; Tues. from 5 to 7:30 commencing Sept. 27th. (4-6 cr.)

The course is planned to meet as far as possible the individual needs of the student. Reading and translation of scientific articles selected by the student in the field he is interested. Prerequisite: Elementary Italian.

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DETERMINATIVE MINERALOGY (II) - Miss Jewell G. Glass; Mon. and Wed. at 4:50 commencing Sept. 26th. (4-6 cr.)

This course is designed for students who wish to acquire a practical knowledge of the physical and optical properties of the common rock forming minerals. Students should have had the equivalent of college freshman chemistr and physics, but not essential. The course will embrace the following topics:

I. General physical properties of minerals.
   A. A Study by inspection of the individual minerals, in hand specimens, both in crystal form and in rock masses.
   B. Descriptive physical characteristics.
   C. Chemical properties; simple laboratory tests.
II. Introduction to the use of the petrographic microscope.
   A. Technique of preparation of rocks and minerals for microscopic study.
   B. Determination of minerals in crushed grains.
   C. Determination of minerals in thin section.

RADIO ENGINEERING (IV,V) - Dr. Louis Cohen; Mon. and Wed. at 4:50 commencing Oct. 3d. (4 cr.)

First semester. Electrical circuit theory, including an analysis of free and forced oscillations in various types of radio circuits for transmission and reception of signals, and a discussion of filter circuits and antenna; also problems in wave propagation.

Second semester. The theory of the vacuum tube and its use as amplifier, oscillator and detector, and a discussion of other problems relating to transmission and reception of radio signals.

Emphasis will be placed on the mathematical processes useful for the solution of radio problems.

SOILS: THEIR MORPHOLOGY, GENESIS AND CLASSIFICATION (V) - Dr. Charles E. Kellogg; Mon., Wed. and Fri. at 4:50 commencing Oct. 3d. (3 cr.)

The course will outline the principles of soil development with examples from the United States. Students should have had the equivalent of college freshman chemistry; previous training in plant physiology, geology, geography, and logic would be helpful, but not essential. The particular material drawn from these fieldswould be developed in the lecture and in assigned readings.

In the development of the course the subject matter will be treated in the following order:

(1) Brief history of the development of soil science, especially in its relationship to agriculture.
(2) The nature of soils. A summarized discussion of the principal properties of the soil mass such as color, texture, structure, colloids, and similar fundamental characteristics. This material will be treated briefly and only those important phases will be discussed which bear directly upon the remainder of the course.
(3) The factors of soil genesis
   (a) Parent rocks and weathering; (b) influence of living matter; (c) influence of climate; (d) influence of relief.
(4) Determination of soil morphology and the classification of types.

SOILS: THEIR MORPHOLOGY, GENESIS AND CLASSIFICATION -- continued.

(5) The processes of soil development. This section will include about half or more of the course, and the great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed. These are: calcification, podzolization, laterization, salinization, solidization, solonization, gleization.

(6) Systems of soil classification.

(7) A few lectures at the class summarizing the whole and discussing the implications and relationships to agriculture as a whole.

A second semester of this course will be followed with seminars on land classification, depending upon the wishes of the class. One or two lectures at the close will be devoted to land classification.

SOIL CONSERVATION - available in 1939-40.

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COTTON MARKETING (I) - Mr. John W. Wright, with the assistance of experts in the different aspects of marketing; Mon., Wed. and Fri. at 4:45 commencing Sept. 26th for a period of ten weeks. (2 cr.)

This course will take up different types of cotton, the relation of standardization, cultural methods, trade practices, and other factors relating to the marketing problem.

COTTON CLASSING (III,IV) - Mr. J. T. Moriarity, in cooperation with the Cotton Division, Bureau of Agricultural Economics; a ten weeks course held in the Cotton Division Laboratory on the sixth floor of the Annex Building, 12th and C Sts., S.W., from 4:30 to 5 daily and 1:30 to 3:30 on Saturdays, with permission to substitute 8:30 to 9 a.m. periods daily, commencing April 3, 1939. (2 cr.)

Limited to those having expert knowledge of cotton. The course will give a general knowledge of cotton as to grade, color, staple, and preparation. Registration limited to fifteen.

GLASS BLOWING - Dr. Leland B. Clark; Mon. and Wed. at 4:50 commencing Sept. 26th. This course is conducted in the basement of the Smithsonian Institution. Fee: $18 a semester, including materials.

This course will be a repetition of that given last year, in which the simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the so-called "soft glasses" will be utilized for practice; during the second semester the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work. Registration is limited to 10 students.

MATHEMATICAL PREPARATION FOR STATISTICS

The instructor or Dr. Deming should be consulted by any persons who are in doubt about their preparation and fulfilment of prerequisites.

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* 1 ALGEBRA (I) - Mr. Harry J. Winslow; Tues. and Thurs. at 4:45 commencing Sept. 27th, 1st sem. only. (2 cr.)

The fundamental rules of algebra; exponents; logarithms; proportion; manipulations with proportions; identities and conditions; solution of equations; binomial theorem, numerical approximations. Uses of symbols of operations. Determinants; solution of equations by the reciprocal matrix. Theory of equations. Progressions; series. Permutations and combinations. Graphical methods will be illustrated throughout the course.

Prerequisite: High school algebra and geometry. For students who can not meet these requirements a special class in beginning algebra and geometry will be organized if there is sufficient demand.

* 2 TRIGONOMETRY AND GEOMETRY (I) - Mr. Harry J. Winslow; 2d sem. only. (2 cr.)

Definitions in trigonometry; identities; complex numbers; DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves. Polar coordinates. Families of curves; one or more parameters. Parametric equations of curves. Radical axis; graphic solution of equations. Some three-dimensional geometry.

Prerequisite: Mathematics 1 or its equivalent.

* 3, 4 CALCULUS (II) - Dr. W. Edwards Deming. Offered in alternate years; due 1939-40.

* 5 HIGHER ALGEBRA (III) - Dr. E. J. Finan of Catholic University; Wed. and Fri. 4:45-6 commencing Sept. 30th, 1st sem. only, this and alternate years. (3 cr.)

Miscellaneous equations; proportion and manipulation thereof; mathematical induction; multinomial theorem; inequalities; undetermined coefficients; determinants, theory of equations, some matrix algebra; root-squaring processes. The student will have an opportunity to learn something about mathematical rigor. Text: Hall and Knight Higher Algebra (Macmillan).

Prerequisite: Two semesters of college mathematics (courses 1 and 2).

* 7 THE CALCULUS OF FINITE DIFFERENCES (II,V) - Dr. W. Edwards Deming; Mon. and Wed. 4:45 commencing Oct. 3d; 1st sem. only, this and every third year. (3 cr.)

The object is to study the elements of interpolation and to approach the infinitesimal calculus from the viewpoint of finite differences. Topics: divided differences; Newton's general formula. Aitken's processes. Double-entry interpolation. The remainder. The Euler-Maclaurin summation; numerical evaluation of definite integrals. Waring's (Lagrange's) formula. Equally spaced arguments; central difference formulas; Comrie's notation;

* THE CALCULUS OF FINITE DIFFERENCES -- continued.
symbolic expressions. Taylor's series as a limit of the Gregory-Newton formulas. Differences in terms of derivatives; derivatives in terms of differences; subdivision and construction of tables. Inverse interpolation by differences and by Aitken's processes. Reciprocal differences. Machine methods will be developed for all procedures. Texts: Comrie Interpolation and Allied Tables; Deming Interpolation.

Prerequisite: Mathematics 1 and 2 for all; infinitesimal calculus (mathematics 3 and 4) for persons desiring graduate credit.

9 MATHEMATICS OF INVESTMENT (IV,V) - Messrs. Eugene A. Rasor and Dorrance C. Bronson, F. A. S., both of the Social Security Board; Tues. and Thurs. at 4:45 commencing Oct. 4th, ending about the middle of March; this and every third year. (3 cr.)

This is an advanced course and will provide training for the personnel of various insurance programs, also directed study for students of actuarial science. Topics: Interest and discount functions, annuities-certain, valuation of mortgages, debentures, and other securities; loans repayable by cumulative sinking funds. Determination of bond yield and rate of interest. Application of the finite and infinitesimal calculus to interest problems required for graduate credit. Text: Ralph Todhunter Compound Interest and Annuities-Certain (the text recommended for part 4 of the actuarial examinations).

Prerequisite: A year of college mathematics; also calculus for graduate credit. (A more elementary course is listed under accounting.)

* 11, 12 ADVANCED CALCULUS (IV,V) - Mr. Albert Wertheimer of the Navy Ordnance; Wed. and Fri. at 4:45 commencing Sept. 30th; this and alternate years. (4 cr.)

Review of the fundamental theory of the calculus. Taylor's series and related subjects. Plane curves, envelopes, order of contact. Differentiation and integration of integrals. Line, surface, and volume integrals. Infinite and improper integrals. Some calculus of variations. Asymptotic series and approximations to definite integrals. Functions with several variables. Function scales and relations between derivatives. Reduction of curves to linear relations. Surfaces, tangent planes, and normals. Some study in the complex variable. Text: E. B. Wilson Advanced Calculus.

Prerequisite: Mathematics 3 and 4.

13, 14 LINEAR ALGEBRA (V) - Mr. M. A. Girshick. Given every third year; not due until 1940-41.

15, 16 THEORY OF INFINITE PROCESSES (V) - Dr. C. Winston. Given every third year; not due until 1939-40.

17, 18 THEORY OF FUNCTIONS (V) - Mr. M. A. Girshick. Given every third year; not due until 1939-40.

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Some other mathematical courses are listed under Statistics, following.

STATISTICS

The instructor or Dr. Deming should be consulted by any persons who are in doubt about their preparation and fulfilment of prerequisites.

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The Graduate School plans to bring annually to Washington one or two leaders in statistical thought. In the past, R. A. Fisher, J. Neyman, John Wishart, Frank Yates, and Walter A. Shewhart have given courses of lectures here with informal seminars, some of which are available in print (see announcement regarding publications from the Graduate School on page 28).

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SEMINARS IN STATISTICS - 2d and 4th Thursdays of each month, 10:30 to noon, commencing Oct. 13th. Membership is limited to people who can contribute a survey of original work or of journal articles. This is not a credit course, but is the official work of those attending. Fee: $2 the 1st semester, $1 the 2d. Applications with cheques should be sent in writing to the Director.

1 INTRODUCTION TO STATISTICAL ANALYSIS (II) - Messrs. B. R. Stauber, G. E. Ockey, and Clayton V. Taylor; Mon. and Wed. at 4:45 commencing Sept. 21st., also Tues. and Thurs. at 4:45 commencing Sept. 20th. Offered also the 2d semester. (2 cr.)

This course is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs, and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, and introduction to the construction and significance of index numbers, and the analysis of time series.

Prerequisite: Mathematics 1 or equivalent.

2 INTRODUCTION TO STATISTICAL ANALYSIS (II) - Messrs. B. R. Stauber, G. E. Ockey, and Clayton V. Taylor. Offered both semesters. The fall semester meetings will be held Tues. and Thurs. at 4:45 commencing Sept. 21st. (2 cr.)

This will be in continuation of the first semester, and will be devoted to the analysis of relationships between two or more variables. This will include a consideration of the measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to multiple linear correlation, and an introduction to the concept of variance analysis in relation to correlation.

Prerequisite: Statistics 1, or equivalent.

4 STATISTICS LABORATORY (II) - Dr. Beatrice Aitchison; once weekly on Thursdays at 7, commencing Sept. 29th. Offered also the 2d semester. (1 semester credit for students taking course 2 or who have had its equivalent.

A laboratory section, meeting once a week for two hours for instruction and practice in the application of machine methods to the statistical processes presented in course 2. Students not registered in course 2 will be given other assignments.

* 5 INDEX NUMBERS AND TIME SERIES ANALYSIS (III) - Mr. C. M. Purves; Tues. and Thurs. at 5, commencing Sept. 20th, 1st sem. only. (2 cr.)

The problems of construction, sampling, and weighting of the various types of index numbers are taken up in this course and an analysis is made of the more commonly used index numbers of prices, production and banking statistics. The analysis of time series includes a review of the methods of measuring and application to specific problems.

Prerequisite: Statistics 1 and 2.

* 6 CORRELATION ANALYSIS (III) - Mr. C. M. Purves; Tues. and Thurs. at 5, commencing Jan. 24th, 2d sem. only (2 cr.)

The application of advanced correlation methods to practical problems, particularly those involving time series. Various methods including mathematical and freehand multiple curvilinear correlations, use of logarithms and first differences and joint correlation will be applied to a specific problem chosen for analysis. Emphasis is placed upon the limitations of correlation in analyzing problems including time series and the significance of results obtained. The course also includes a brief review of the analysis of variance and its relationship to correlation.

Prerequisite: Statistics 1 and 2, also 5.

* 7, 8 THE INTERPRETATION OF STATISTICAL CALCULATIONS (III) - Mr. Alexander Sturges; Mon. and Wed. at 4:45 commencing Sept. 21st. (4 cr.)

In the first semester attention is given to the philosophy and assumptions involved in making statistical inferences from sampling data. The conditions of sampling will be stated, and the results of inadequacy in meeting these conditions will be discussed. The importance of various distributions, such as the normal, and chi-square, etc., will be emphasized. No mathematical proof will be offered, but the approach to these distributions will be illustrated by sampling experiments.

The second semester will deal with the selection and use of statistical tests to reach satisfactory practical judgements in a wide variety of problems. Emphasis will be placed on the choice of method so that the student may learn to seek the simplest and most effective of several alternatives. The illustrative problems will include those dealing with single as well as multiple attributes and variables under simple sampling conditions; also with time series, and allied situations in which conditions of sampling are not adequately met.

Prerequisite: Statistics 1 and 2 and Mathematics 1 and 2.

9, 10 STATISTICS FOR BIOLOGICAL WORKERS (III) - Professor W. B. Kemp of the University of Maryland. Not offered in 1938-39.

11 STATISTICAL TREATMENT OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (II) - Dr. A. E. Brandt; Tues. and Thurs. at 4:45 commencing November 15th and ending March 16th. (2-3 cr.)

Special emphasis will be placed on the design of experiments, and the statistical analysis of the observations. The concept of independent comparisons of individual degrees of freedom will be used. Randomized blocks, Latin squares, factorial and pseudo-factorial designs will be discussed in detail; also confounding and partial confounding; examination of methods of analyzing data from experiments involving these methods.

STATISTICAL TREATMENT OF EXPERIMENTS -- continued.

A seminar for further elaboration of statistical theory will be held weekly on Fridays at 3 o'clock, at which various statisticians will be called in on consultation and special developments. One hour additional credit will be given to those who carry out the special reading and calculations to be advised.

Prerequisite: High school algebra. Opportunities will be provided in the use of more mathematics for those who are qualified.

13, 14 ADJUSTMENT OF OBSERVATIONS (V) - Dr. W. Edwards Deming. Not offered in 1938-39.

* 16 LEAST SQUARES (IV,V) - Dr. W. Edwards Deming; Mon. and Wed. at 4:45 commencing Jan. 25th; 2d semester only, this and every third year. (2 cr.)

Some theory of errors and review of statistical distributions. History of least squares. The chi-test; estimates of precision. Least squares as the minimizing of chi-square. Problems in curve fitting and geodesy. Weights. Propagation of errors. The general problem. Systematic computation. Applications to triangulation, physics, and agricultural experiments. Texts: Deming and Birge Statistical Theory of Errors; Deming Least Squares.

Prerequisite: Statistics 1 and 2; Mathematics 3 and 4.

* 17, 18 MULTIVARIATE ANALYSIS (V) - Mr. M. A. Girshick; Tues. and Thurs. at 4:45 commencing Sept. 27th, this and every third year. (4 cr.)

Function theory is reviewed as necessary. Some theorems on probability; theorems on mean value; moment generating functions; the characteristic function. Multivariate normal distribution; joint moments of sample variances and covariances. Sampling from a bivariate normal population. Tests of significance; problems of estimation. Joint distribution of variance and covariance; distribution of correlation coefficient when the population correlation is and is not zero. Least squares; classical application; relation to maximum likelihood. Distributions of the multiple correlation coefficient. Orthogonal polynomials. Derivations of some of the Wilks, Pearson, and Neyman distributions. Factor analysis. Canonical correlation. Non-normal distributions. Applications.

Prerequisites: A course in advanced statistics; Mathematics 3, 4, 13, 14.

* 19 ANALYTIC CURVE FITTING (IV,V) - Dr. Max Sasuly; Mon. and Wed. at 5 commencing Sept. 28th; 1st semester only, this and every third year. (2 cr.)

Curve fitting as a functional representation of empirical data from the natural and social sciences. Fitting by polynomials, harmonic functions, exponentials, and other special forms. Analytic criteria of fitting; summary of historical developments; modern extensions. Special techniques.

Prerequisites: Statistics 1, 2, 4; Mathematics 1, 2, 3, 4.

* 20 DYNAMIC ANALYSIS OF TIME SERIES (IV,V) - Dr. Max Sasuly; Mon. and Wed. at 5 beginning Jan. 30th; 2d sem. only, this and every third year. (2 cr.)

Fitting by differential equation relations for interacting series; generalized multiple correlation. Integral equation relations for special economic series.

Prerequisites: Statistics 1, 2, 4; Mathematics 1, 2, 3, 4.

21, 22 THEORY AND APPLICATION OF THE CHARACTERISTIC FUNCTION (V) - Dr. Soloman Kullbach. To be offered in 1939-40.

23, 24 SPECIAL TOPICS IN STATISTICS (III) - Fridays at 4:45 commencing Oct. 7th. (2 cr.)

This will be a series of from one to three lectures by each of a number of experts in various fields of application, mainly in sampling procedure. The following lectures have been arranged, and others will be added:

Oct. 7th and 14th, Mr. Frederick F. Stephan, "Some principles of sampling for population surveys," and "Pitfalls for statistical investigators."

Oct. 21st and 28th, Mr. Sidney W. Wilcox, "Adjustment of indexes of employment and payrolls to census data," and "The problem of over-exposure in sampling."

Nov. 4th and 18th, Dr. Charles F. Sarle, "Estimating agricultural production from sample data," and "An annual economic survey of American agriculture."

Nov. 25th and Dec. 2d, Dr. Forrest E. Linder, "The collection of vital statistics in the United States," and "The interpretation of mortality rates."

Jan. 27th and Feb. 3d, Mr. Walter A. Hendricks, "Theory and application of the chi test," and "Mathematical statistics in agricultural research."

Feb. 10th and 17th, Dr. L. R. Hafstad, "The Bartels' technic for non-independent observations, including time series."

Feb. 24th, March 3d and 10th, Mr. Archie Blake, "Topics in the foundations of statistical theory."

March 17th and 24th, Dr. Otis A. Pope, "Factorial experiments," and "Certain relationships of design."

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See also courses in Mathematics and Economics.

TECHNICAL SHORTHAND SPEED WRITING - Miss Clara E. Richter; Mon. and Wed. at 4:50 commencing Oct. 3d. (Entrance speed to be 100 words per minute.)

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed; in addition, supplementary relevent material will be used. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand that they write prior to entering the class. A non-technical entrance examination will be held Saturday, Spetember 24th, in room 1039 South Building at 2 p.m., at the rate of 100 words per minute. Transcription must be in ink. It is required that each student have an admission card to the examination room, which can be obtained from the Graduate School, room 4090 South Building. All admission cards must be secured prior to date of examination.

TECHNICAL SHORTHAND SPEED WRITING - (130 to 170 words per minute) - Miss Clara E. Richter; Tues. and Thurs. at 4:50 commencing Oct. 4th. No entrance examination is required.

STENOGRAPHY IN GERMAN, FRENCH, DUTCH, SPANISH, AND ITALIAN - Mr. Fred Neter (diploma from the French Academy of Stenography, Paris); Mon. and Wed. at 4:50 commencing Oct. 3d.

For beginners and advanced students who are interested in taking up shorthand in any of these languages. Persons not familiar with the respective languages may obtain preparatory training.

* PRINCIPLES OF RURAL-URBAN SOCIOLOGY (V) - Drs. Carl C. Taylor and C. P. Loomis; Mon. and Wed. at 4:50 commencing Sept. 26th. (2 cr.)

This course will cover a general survey of outstanding rural social problems in the United States and make comparisons between urban and rural societies; between American and European rural life; and between primitive or simpler societies and modern society. Outstanding topics for discussion and assigned reading will be: Urban and rural differences; population composition and migrations; rural community structure and organization; economic and social status of farm classes; farmers' organizations; and the rural standard of living.

Prerequisites: One semester course in sociology and three additional semester courses in sociology and economics, i.e. four semester courses in sociology and economics, one at least of which must have been in sociology.

* RURAL SOCIAL PSYCHOLOGY (V) - Drs. Carl C. Taylor and C. P. Loomis; Mon. and Wed., 2d sem. only. (2 cr.) Ask for special announcement.

GENERAL PSYCHOLOGY (IV) - Dr. Paul Kaufman; Tues. and Wed. from 5:15 to 6:30 commencing Sept. 26th. (6 cr.)

A general survey of the nature of human personality, studied by scientific methods. Following a preliminary outline of the leading current schools of psychological thought, presented in the perspective of older views of personality, the course proceeds to a description of the nervous system and sense organs. Analysis is then made of the elements of behavior at various levels. Among the processes examined are perceiving, imagining, learning, remembering, feeling, and thinking, with special attention to

GENERAL PSYCHOLOGY -- continued.
motivation in the emotions. Other essential subjects considered are habit, intelligence, aptitudes, the subconscious, complexes, the resolution of conflicts, and the principal explanations of the relation between mind and body. Emphasis is placed on the consciousness and behavior of adults; the psychology of the infant is summarized in relation to the problems of instinct and reflexes and to the factors of heredity and environment.

The course is intended to be of practical value in developing a deeper knowledge of the individual self and in stimulating more effective adjustment to one's surroundings.

SOCIAL PSYCHOLOGY (IV) - Dr. Paul Kaufman; Tues. and Thurs. from 5:15 to 6:30 commencing Sept. 27th. (6 cr.)

The program of this course is arranged in two divisions: the psychology of group behavior and the social development of the individual. In the first are studied the collective mind of crowds, mass movements, public opinion, propaganda, and the patterns of social attitudes in the various fields of human thought and activity. In the second part, after a brief review of the nature of inherited capacities and of social life, are surveyed the influences of group experience in shaping individual personality. The character and extent of these influences are traced in the adoption of language, habits, conventions, tastes, ideas of right, privileges, and obligations, and general basic modes of feeling and thinking.

The methods of adoption, conscious and unconscious, are also examined in a consideration of the various kinds of contact and of the reactions of different types of individuals to social pressures.

Some previous understanding of elementary psychology is a desirable but not essential foundation for this course.

CURRENT SOCIAL PROBLEMS (IV,V) - Dr. Paul Kaufman; Mon. and Wed. from 7:30 to 8:45 p.m. commencing Sept. 26th. (6 cr.)

This outlined course surveys the following groups of problems as they affect American society at the present time: Adjustments to natural resources, trends of population, race relations and immigration, distribution of wealth and income, poverty and unemployment, health and physical welfare, care and control of defectives, crime, vice, and delinquency, marriage and the family, education and child welfare, public opinion and its agencies, social security, social control in a democracy.

The point of view and method of the course is scientific, with primary emphasis on the discovery of the facts, which are extensively presented in the basic text, Current Social Problems, by J. M. Gillette and J. M. Reinhardt (1937). With the aid of exact knowledge, supported by numerous references to authorities the course aims to prepare for individual study of the problems.

HISTORY OF PHILOSOPHY (IV,V) - Dr. George S. Painter; Tues. and Thurs. from 4:45 to 6 commencing Sept. 27th. (6 cr.)

First semester, Greek philosophy. The history of Greek Philosophy from Thales to Modern Time is the history of earliest human thought. So great was this intellectual movement that we find nearly all the fundamental concepts of science remarkably investigated and developed within this period. This course offers the student an exposition and critical consid-

HISTORY OF PHILOSOPHY -- continued.
eration of the philosophical development from the earliest problems that engaged reflective thought, through the systematic developments of Plato and Aristotle, and the various schools of philosophy growing out of these. The problems of natural science, of being and becoming, and the problems of knowledge, of ethics, and of life, are all considered in their original and simplest beginnings, where they are apprehended in their simplest form.

Second semester, Modern philosophy. The history of Modern Philosophy begins with the Renaissance and comes down to the present time. It involves the fundamental concepts of our modern thought, and the course of their development. Beginning with Campanella and Francis Bacon, the development advances with Descartes, Spinoza, Leibnitz, Locke, Berkeley, and Hume, and comes to critical climax in Immanuel Kant. The post-Kantian philosophy takes a new departure, and was developed under Fichte, Hegel, and Schelling, followed by the philosophy of Herbart, Schopenhauer, and others. Critical attention is given to each of these philosophers, with special consideration of the general development of thought, or the philosophy of the history of philosophy. The aim is to apprehend the basal concepts of human thought.

SURVEY OF PUBLIC PERSONNEL MANAGEMENT AND SUPERVISION and other courses in this field, see bulletin, School of Public Affairs, American University.

* A SEMINAR COURSE ON THE CURRENT DECISIONS OF THE SUPREME COURT (IV,V) - Miss Charlotte A. Hankin; Fri. from 5 to 7 commencing Sept. 30th. (4 cr.) (Miss Hankin, A.B., LL.B., is Associate Editor, U. S. Supreme Court Letter and Progress of the Law in the Supreme Court).

This course will take up for consideration and study the decisions of the Supreme Court of the United States, as they are handed down currently, week by week. It will be prefaced by consideration of the jurisdiction of the Supreme Court, in our judicial set up.

PATENT LAW AND PROCEDURE (IV,V) - Mr. Paul D. Boone; Wed. and Fri. at 4:45 commencing Sept. 28th. (2 cr.)

The course will discuss rules of practice of the U. S. Patent Office; preparation of applications; amendments; Patent Office action; Commissioner's decisions, such as taken up in Woolcott's manual; file histories of patents, etc.

FILING SEMINAR - Mr. John S. Lucas.

This is organized as a non-credit seminar without fee. It is open only to those in charge of files or classification of material to be filed. The class meets weekly, commencing the early part of October.

EXTENSION SEMINARS (IV,V) - Messrs. M. C. Wilson and Barnard D. Joy; twice per week, hour arranged to meet the convenience of class. Room 5534, South Building. Open to those with extension teaching experience, or with background of educational training satisfactory to instructor.

First semester. Extension Organization, Programs, and Projects. A study of the representative organizations of rural people for the purpose of

EXTENSION SEMINARS -- continued.

cooperating in the conduct of extension work. An analytical review of the best procedures to be followed in developing State, county and community programs of work, and the outlining of plans of work looking to the orderly development of specific projects, including a discussion of place of local leaders in extension teaching.

Second semester. Extension Methods. Ways of measuring extension progress; the influence of such factors as size of farms, land tenure, educational training, age, and contact with extension workers upon effectiveness of extension teaching.

The various means and agencies employed in extension teaching such as result demonstrations, method demonstrations, meetings, news articles, personal service, bulletins, exhibits, circular letters, extension schools, and radio, will be carefully analyzed from the standpoint of their teaching function, adaptability to different subject matter, relative influence, relative cost, and interrelationship.

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GENERAL LECTURES

Social Problems of Today - Fri. from 5 to 6, commencing in October,
Dr. Paul Kaufman, Chairman

Human Relations in the Light of Psychology - Fri. from 5 to 6, commencing in January 1939. Dr. Paul Kaufman, Chairman.

Special announcements giving names of speakers and other information will be available upon request after September 1st.

Other lectures will be announced later.

PUBLICATIONS OF THE GRADUATE SCHOOL

	Price
Some Notes on Least Squares by W. Edwards Deming	$1.50
Lectures and Conferences on Mathematical Statistics by J. Neyman, edited by W. Edwards Deming	$1.25
On The Statistical Theory of Errors by W. Edwards Deming and Raymond T. Birge	35¢
Lectures on Statistical Methods (To be ready in November) by Walter A. Shewhart of the Bell Telephone Laboratories	$1.50 *
Lectures on Current Economic Problems by outstanding leaders in that field	50¢
Understanding Ourselves: A Survey of Psychology Today by outstanding leaders in that field	50¢
Elements of Personnel Administration by outstanding leaders in that field	35¢
Administrative Management by outstanding leaders in that field	50¢

(Postage extra)

* Price subject to revision.

Persons who are ready to register for any of the courses listed are urged to fill out the following

REGISTRATION FORM

which provides the most convenient means of registration. It should be mailed previous to September 19th, after which date an extra charge of $2 is due, for the reason that room and section assignments are to be made on the basis of registrations made up through September 19th; late-comers often necessitate readjustments and create extra overhead, as well as inconvenience to those who have already registered and received their room assignments.

To: Dr. A. F. Woods
Director of The Graduate School, Room 4090
U. S. Department of Agriculture
Washington

(Chain envelopes should be used in the Department of Agriculture.)

I should like to register for the following courses:

_____

_____

My educational background is shown below:

_____
(Here show high schools and universities attended, degrees, & dates)

_____

_____

_____

A check / money order for $_____ is enclosed. (Tuition is $6 per semester credit; the fee for a 2 hour course is accordingly $12, for a 3 hour course $18, except when noted. New registration is required for the 2d semester.)

Yours truly,

_____
Name (please write or print plainly)

Residence _____ Telephone _____

Present position _____ Telephone _____

Where employed _____

(A registration card, constituting a receipt, will be mailed to you before classes commence.)

BUREAU OF AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE

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GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

METEROLOGY AND CLIMATOLOGY (III, IV) - Wednesdays and Fridays at 5 commencing November 2d at the Weather Bureau, 24th and M Sts., N. W., in the assembly room, 7 first floor. Dr. Horace G. Byers will be in charge, assisted by Messrs. H. Wexler, C. H. Pierce, and other experts of the Weather Bureau. A portion of the course will be given by Commander W. M. Lockhart of the Navy Dept. Dr. C. W. Thornthwaite of the Soil Conservation Service will assist in the second semester. Fee $12.00 a semester. (4 cr.)

The first semester will be devoted to a general, largely non-mathematical treatment of atmospheric processes with special emphasis on air mass analysis methods and their application to synoptic charts of the surface and upper-air and to forecasting. While the course is intended to be of an introductory nature, those without some familiarity with meteorology will be at a disadvantage.

In the second semester a course in climatology, based on the newer concepts of physical meteorology, will be developed. Problems of agriculture, hydrology, soil conservation, land forms, and human settlement as related to climatic or meteorologic conditions will be discussed.

AGRICULTURAL CREDIT IN THE UNITED STATES (IV, V) - Fridays from 5 to 7:30 commencing November 11th. Instructor: Fred L. Garlock. Fee $18.00. (3 cr.)

This course is concerned with the financial requirements of agriculture and with the methods by which the industry is financed. In part historical, the course will describe the evolution of the financial mechanism for supplying farm credit, will explain historical changes in the use of credit in agriculture, and will trace the movement of the farm debt. Principal attention, however, will be devoted to the present financial conditions and requirements of farmers and the modern mechanism for supplying them with credit. The underlying principles upon which agricultural financing is now conducted will be analyzed.

Essentially the same course was given for several years at the Brookings Institution, under a grant from the Social Science Research Council, by the present instructor.

Register in room 4090 South Building

The lectures on ADMINISTRATIVE MANAGEMENT delivered from October to December, 1937, are now available in printed form at the Graduate School, room 4090 South Building.

In view of the many requests for copies of the lectures on ELEMENTS OF PERSONNEL ADMINISTRATION; PRINCIPLES AND TECHNIQUES, a new edition of this publication has been ordered and will be available within a few days.

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Problems in the Adjustment of Personality

If anything affects your eye,
you hasten to have it removed;
if anything affects your mind,
you postpone the cure for a year.
—Horace.

A COURSE OF TEN LECTURES

Presented by

THE GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

Washington

FRIDAYS AT 5 P. M.

IN THE AUDITORIUM, SOUTH BUILDING

Beginning January 6, 1939

[1939]

23

PROBLEMS IN THE ADJUSTMENT OF PERSONALITY

THIS course is a presentation by authorities of the main fields of our experience in which guidance toward more effective adjustments is often sought.

A limited number of enrollments from other departments and agencies of the government and from the general public will be accepted.

Register in room 4090 South Building from 8:30 a. m. to 5:00 p. m.; Saturdays to 2:00 p. m. Reservations may be made by telephone or mail. Call DIstrict 6350, extension 317. Enrollment fee, $4.00.

THE SUBJECTS AND THE SPEAKERS

What Is the Effectively Adjusted Personality? —*Jan. 6*

DR. HOMER P. RAINEY, *Director, American Youth Commission, American Council on Education*

Making the Best of Our Nerves —*Jan. 13*

DR. ESTHER L. RICHARDS, *Associate Professor of Psychiatry, Johns Hopkins University*

Getting Along With Our Emotions —*Jan. 20*

DR. KARL M. BOWMAN, *Director of the Division of Psychiatry, Bellevue Hospital, New York City; Professor of Psychiatry, New York University College of Medicine*

Finding Freedom From Fear and Worry —*Jan. 27*

Dr. John R. Oliver, *Associate in the History of Medicine, Johns Hopkins University; sometime Psychiatrist, Johns Hopkins Hospital*

Educating Ourselves in the Problems of Sex —*Feb. 3*

Dr. Winifred V. Richmond, *Psychologist, St. Elizabeths Hospital, Washington*

Adjustments in Marriage and Family Relations —*Feb. 10*

Dr. Joseph K. Folsom, *Professor of Sociology, Vassar College*

Adjustment in Relation to the Unconscious —*Feb. 17*

Dr. Kenneth E. Appel, *Psychiatrist, The Institute of the Pennsylvania Hospital; Assistant Professor of Psychiatry, Medical School, University of Pennsylvania*

Adjusting Ourselves to the Daily Work —*Feb. 24*

Dr. Walter V. Bingham, *Director, Personnel Research Federation, New York City*

Adjustment and Social Attitudes —*March 3*

Dr. Goodwin Watson, *Professor of Education, Teachers College, Columbia University*

The Problem of Adjusting the Whole Personality —*March 10*

Dr. Hornell Hart, *Professor of Sociology, Duke University*

Dr. Paul Kaufman, Chairman of Lecture Series in the Social Sciences, will preside.

In Our Efforts to Discover

more effective adjustment of ourselves to our surroundings, particularly to other human beings, the recent advances of psychology and mental hygiene offer us guidance of the greatest practical value.

This course presents an analysis of the main fields of personality adjustment in which almost everyone must be concerned. Because of the importance of these practical subjects discussed by a group of nationally known authorities, this series of lectures affords an unusual opportunity.

A. F. Woods,
Director.

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GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

STATISTICAL TREATMENT OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (II) - Dr. A. E. Brandt; Tues. and Thurs. at 4:45 commencing November 22nd and ending March 23rd. (2-3 cr.)

Special emphasis will be placed on the design of experiments, and the statistical analysis of the observations. The concept of independent comparisons of individual degrees of freedom will be used. Randomized blocks, Latin squares, factorial and pseudo-factorial designs will be discussed in detail; also confounding and partial confounding; examination of methods of analyzing data from experiments involving these methods.

A seminar for further elaboration of statistical theory will be held weekly on Fridays at 3 o'clock, at which various statisticians will be called in on consultation and special developments. One hour additional credit will be given to those who carry out the special reading and calculations to be advised.

Prerequisite: High school algebra. Opportunities will be provided in the use of more mathematics for those who are qualified.

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GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

COURSES STILL OPEN FOR REGISTRATION

There is still opportunity to register in the following courses in the GRADUATE SCHOOL OF THE DEPARTMENT OF AGRICULTURE:

PRINCIPLES OF ACCOUNTING - FIRST AND SECOND YEAR COURSES, beginning Oct. 3rd

STATISTICS COURSES - ELEMENTARY AND ADVANCED, beginning Oct. 3rd

BASIC PHOTOGRAPHY - A COURSE FOR BEGINNERS, beginning Oct. 3rd

PUBLIC SPEAKING - PRACTICAL AND ADVANCED COURSES, beginning Oct. 4th

ENGLISH - COURSES IN GRAMMAR, GOVERNMENT CORRESPONDENCE, EDITING AND LITERATURE, beginning Oct. 3rd and 4th

ECONOMICS - ELEMENTARY AND ADVANCED COURSES, beginning Oct. 3rd

LANGUAGES - ELEMENTARY AND ADVANCED COURSES IN FRENCH, GERMAN, ITALIAN, RUSSIAN, SPANISH, as well as CONVERSATIONAL SEMINARS, beginning Oct. 3rd and 4th

GRAPHIC PRESENTATION - ECONOMIC DATA, ARCHITECTURAL, MECHANICAL and FREEHAND DRAWING, SKETCHING and BLUEPRINT READING, beginning Oct. 15th

PSYCHOLOGY, SOCIOLOGY, PHILOSOPHY, LAW, beginning Oct. 3rd and 4th

MATHEMATICS, ELEMENTARY AND ADVANCED COURSES, including ALGEBRA, GEOMETRY, TRIGONOMETRY, CALCULUS, etc., beginning Oct. 3rd and 4th

CHEMISTRY - ELEMENTARY AND ADVANCED COURSES, beginning Oct. 3rd

STENOGRAPHY - 50 to 100 WORDS; 100 to 130 WORDS; 130 to 170 WORDS; and 190 WORDS A MINUTE, beginning Oct. 3rd and 15th

The Congress of the United States has made special provision for making the facilities for study and research in the government departments available to qualified individuals, students and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe (Joint Res. April 12, 1892-27 Stat. 395; Deficiency Act of March 3, 1901-31 Stat. 1010, 1039).

The formal outline of courses is organized on a college basis, and a certificate showing the work accomplished is issued to each student upon request. These certificates are accepted by the Civil Service Commission, and by graduate schools and accredited colleges wherever the work fits into the program of studies approved by such schools.

Those desiring training in these fields should communicate promptly with the Graduate School, Department of Agriculture, Room 4090 South Building.

F - L - I - E - R

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

EXTENSION SEMINAR - ORGANIZATION AND CONDUCT OF 4-H CLUB WORK (V) - Barnard Joy; Mon. from 7:30 to 9:30 p.m., commencing Oct. 10th, in room 5534, South Building. (2 cr.) Fee - $12.00. Register in room 4090 South Building, office of the Graduate School, Department of Agriculture.

The course includes the development of 4-H club programs and organization considering: objectives, psychological groupings, community integration, program content, community, county, State, and Federal organization, selection and use of local leaders, annual plans of work, and evaluation. It takes into consideration the methods employed in 4-H work including: projects, club meetings, demonstrations, judging work, exhibits, achievement days, camps, short courses, and leader training.

Prerequisite: Experience as an extension worker or background of educational training satisfactory to the instructor.

AN INTRODUCTION TO THE ART OF THINKING (I) - Miss Cecile Willink; Fri. from 7 until 9 p.m., commencing Oct. 7th. Room 4092 South Building. Fee $12.00 per semester.

This course is intended for those who would vitalize their mental life; who would have greater opportunity for self-realization. (Among the thousands of "gainful occupations" listed by the Census Bureau, not one in a hundred offers any outlet for the higher abilities. Thus, for most of us the work we do is but a small phase of our life, affording little opportunity for living, and we ourselves must develop ways of expression.) One method is a pleasant form of mental discipline.

This course consists of a study of words, in their ordinary and symbolic use; the making of abstracts of sentences, paragraphs, and longer selections; the study of poems, beginning with simple masterpieces, by précis-writing and appreciation; finally, the memorizing and vocal interpretation of the poems. Further appreciation will proceed in the approach to another art -- the study and enjoyment of a few masterpieces of painting.

Since the course consists of two phases -- Impression and Expression -- the students will be called upon from time to time to give talks on the subjects studied.

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A course in AERIAL PHOTOGRAPHY is in the process of organization. It will include the types of work, in this field, of interest to workers in Soil Conservation, Soil Survey, and other agencies charged with similar programs. The course will be in charge of an expert.

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GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

Students desiring to take work in the Graduate School are urged to get the complete catalogue from room 4090 South Building, and to select their courses as promptly as possible. Unless otherwise arranged, registration must be completed by September 20th. Courses begin the following week.

MICROBIOLOGY (III) - Dr. Chas. Wm. Rees; Mon., Wed. and Fri., (or days to be arranged) beginning on or about September 26th (6 cr.). The course will include two lectures and one laboratory period for the week. Fee $20.00 per semester - this includes a charge for laboratory material.

The course will comprise a study of methods of investigation used in diagnosing diseases, detecting clinical symptoms, and studying post-mortem anatomy; also of the types of organisms involved and the techniques of their investigation. Opportunity will be given to examine the latest equipment in government laboratories. The laboratory will comprise special demonstrations and assignments of problems in cooperation with investigators having available equipment. The work will be given at the Bureau of Dairy Industry, Beltsville, Md. Registration limited to twenty-five students.

ECONOMICS OF AGRICULTURAL PRODUCTION (III) - Dr. R. H. Allen and Dr. Sherman E. Johnson; Mon. and Wed. at 7:30 p.m., commencing Oct. 3d. (2 cr.) Tues. and Thurs. may be substituted if desired. Fee $12.00 per semester.

First semester. This course is planned as an introduction to the course in farm management to be offered the second semester. It stresses the principles basic to the economic problems of production which are encountered in farm management, land economics, soil conservation and similar fields. It is aimed at an understanding of the economic basis of agricultural production and the development of principles of production economics as useful tools in analysis of problems with which the student is concerned.

Prerequisite - Principles of economics or its equivalent.

FARM MANAGEMENT (IV) - Drs. Sherman E. Johnson and C. L. Holmes; Mon. and Wed. at 7:30 p.m., commencing Jan. 30th. (2 cr.) Tues. and Thurs. may be substituted if desired. Fee $12.00 per semester.

Second semester. This course considers the most economic combination of resources used in farming, the combination of farm enterprises and their efficient operation on individual farms and the basis for formulation of farming programs for agricultural areas.

Prerequisite - Economics of agricultural production or its equivalent.

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GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

COTTON MARKETING (III-IV) - Dr. John W. Wright and specialists in various phases of cotton marketing; Mon. and Wed. at 4:45 commencing Oct. 3d. (2 cr.) Fee $12.00 per semester.

This course is designed to provide a well-rounded picture of the marketing system for raw cotton, particularly for those engaged in research or service activities that have to do with cotton. The course will open with a brief discussion of such factors affecting the marketing system as the characteristics and uses of cotton lint, and the localization of production and manufacture, after which a more detailed study will be made of the market mechanism for cotton and its functioning through all stages of the distributive process from sale by producers to purchase by spinners. Special attention will be given to the functioning of various types of cotton markets and marketing agencies, to auxiliary services incident to marketing rendered by private as well as by public agencies, and to the major problems to be solved in order to provide a more efficient marketing system for this commodity.

AN INTRODUCTION TO THE ART OF THINKING (I) - Miss Cecile Willink; Fri. from 7 until 9 p.m., commencing Oct. 7th. Room 4092 South Building. Fee $12.00 per semester.

This course is intended for those who would vitalize their mental life; who would have greater opportunity for self-realization. (Among the thousands of "gainful occupations" listed by the Census Bureau, not one in a hundred offers any outlet for the higher abilities. Thus, for most of us the work we do is but a small phase of our life, affording little opportunity for living, and we ourselves must develop ways of expression.) One method is a pleasant form of mental discipline.

This course consists of a study of words, in their ordinary and symbolic use; the making of abstracts of sentences, paragraphs, and longer selections; the study of poems, beginning with simple masterpieces, by precis-writing and appreciation; finally, the memorizing and vocal interpretation of the poems. Further appreciation will proceed in the approach to another art -- the study and enjoyment of a few masterpieces of painting.

Since the course consists of two phases -- Impression and Expression -- the students will be called upon from time to time to give talks on the subjects studied.

(over)

AGRICULTURAL ECONOMICS
U. S. DEPARTMENT OF AGRICULTURE

F - L - I - E - R

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

NOV 16 1936

Note: On account of the rainy weather, the penalty for late registration has been lifted for the rest of this week (i.e. until October 1st).

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The Graduate School wishes to direct attention to the course

SPECIAL TOPICS IN STATISTICS

Fridays at 4:45; 1 hour

Fee $6 per semester

First lecture Oct. 7th.

No outside study required. The first four lectures are as follows:

October 7th and 14th, Mr. Frederick F. Stephan, "Some principles of sampling for population surveys," and "Pitfalls for statistical investigators."

October 21st and 28th, Mr. Sidney W. Wilcox, "Adjustment of indexes of employment and payrolls to census data," and "The problem of over-exposure in sampling."

For other lectures, see page 23 of the Graduate School bulletin.

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Other courses in
MATHEMATICS and STATISTICS

-- Offered this semester --

College Algebra. Mr. Winslow, Tues. and Thurs. at 4:45 beginning Sept. 27. Room 4637.

Calculus of Finite Differences. Dr. Deming, Mon. and Wed. at 4:45 beginning Oct. 3d. Room 1031.

Mathematics of Investment. Mr. Rasor and Mr. Bronson, F.A.S., Tues. and Thurs. at 4:45 beginning Oct. 4th. Room 1031.

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F - L - I - E - R

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

Advanced Calculus. Mr. Wertheimer, Wed. and Fri. at 4:45 beginning Sept. 30th. Room 1459.

Introduction to Statistical Analysis. Messrs. Stauber, Ockey, and Kullbach, Mon. and Wed., also Tues. and Thurs., at 4:45 beginning Sept. 20th and 21st. Room 1039.

Statistics Laboratory. Dr. Beatrice Aitchison, Thursdays at 7 p.m. beginning Sept. 29th. Room 4090.

Interpretation of Statistical Calculations. Mr. Alexander Sturges, Mon. and Wed. at 4:45 beginning Sept. 21st. Room 3034.

Statistical Treatment of Experiments. Dr. Brandt, to commence about Nov. 15th; end March 15th.

Multivariate Analysis. Mr. Girshick, Tues. and Thurs. at 4:45 beginning Sept. 27th. Room 1027.

Analytic Curve Fitting. Mr. Sasuly, Mon. and Wed. at 5 beginning Sept. 28th. Room 1027.

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A course in preparatory algebra is being organized for students not ready to go into College Algebra. Register now; course begins October 15th.

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Some others available in the 2d semester only; see the bulletin for details.

(over)

Rec'd July 15, 1938

UNITED STATES DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

Preliminary List of Courses 1938-1939

The General Bulletin of Information will be ready July 15th, and will include the following courses. The designations I to V indicate year levels; numbers following in parenthesis refer to cocperative course numbers in American University. Other courses than those indicated may be made cooperative if request is made in advance at time of registration. The number of credits to be granted is indicated in brackets [ ].

Additional courses are being considered. Those desiring courses not listed in this program should consult the Director of the Graduate School.

Graduate credit can be obtained only by those who have a bachelor's degree from a standard college or university. Undergraduate credit requires graduation from a standard high school or equivalent.

For a copy of the general bulletin, or for further information, write to Eva M. Johnson, Secretary, or to A. F. Woods, Director, 4090 South Building.

DEPT. OF AGRICULTURE

Accounting
- Principles of Accounting. Year (Rowe, Jarvis, Nielsen; III B.A.331-332) [6].
- Accounting, second year. Year (Nielsen; III B.A.334) [6].
- Income Tax Procedure. One sem. (; IV B.A.) [3].
- Cost Accounting. One sem. (; IV-V) [3].
- Interrelations between Economic Theory and Accounting. Year (Massel; IV-V) [4].
- Mathematics of Finance. One sem. (Rowe; IV B.A.401) This year and alternate years. [2]. (See also Mathematics of Investment under Mathematics)

Bacteriology. Year (Rees; IV-V) [4].

Botany
- Systematic (flowering plants). Year (Blake; II-III) [4].
- Plant Ecology. Year (Waite; IV-V) [6].
- History of Botanic Research. Year (Cook; IV-V) [6].
- Plant Breeding with Reference to Disease Resistance. One sem. (Stevenson; V) [3].

Chemistry
- Organic, introduction. Year (Clarke; III) [4].
- Organic, advanced. Year (Rose; IV-V) [4].
- Inorganic, advanced. Year (Hoffman; IV-V) [4] (Not given 1938-39; avaliable again in 1940).
- Physiological. Year (Calvery; IV-V) [4].

Cotton Classing. Classes by special arrangement. (III-IV) [2] (Limited to those having expert knowledge of cotton)

Economics

Social and Economic History of American Agriculture. Year (Edwards; IV-V) [6].
History of Economic Thought. Year (Wasserman; IV-V) [4].
Contemporary Economic Problems. Year (Wasserman; IV-V) [4].
Money and Banking. Year (Wasserman; IV-V) [4].
Principles of Economics. Year (Braun; III) [6].
Foreign Trade Problems in Relation to Agriculture. Year (Wheeler; IV-V) [4].
Economics of Instability. One sem. (Ezekiel and Bean; V) [3].
Farm Management. Year (; IV-V) [6].

English

Descriptive English Grammar. One sem. (Harman; IV-V) [3].
Applied English Grammar. One sem. (Harman; IV-V) [2].
Modern Poets, first sem. American, second sem. English. Year (House; IV-V) [6].
Rural Novel. One sem. (Sherman; IV-V) (seminar)
English Novel. Year (Kerr; IV-V) [4].
English Literature Since 1800. Year (Kerr; IV-V) [6].
Seminar in Creative Writing. Year (Barron; II) [4].
Government Correspondence. Year (Sanders; I) [4].
Practical Public Speaking. One sem. (King; I) [2].
Editing Manuscripts on Agriculture, Home Making and Related Subjects. One sem. (Merrill; IV-V) [3].
Library Survey. Year (Barnes; II) [4].

Glass Blowing. Year (Clark; IV-V) [4]. Class limited to 10.

Graphic Presentation

Principles and Practice of Graphic Presentation of Economic Data. Year (Hainsworth; IV-V) [3].
Freehand Drawing, Elementary. Year (Magnuson; II) [8].
(4 hours a week and 4 hours assigned work).
Architectural Drawing. Year (Magnuson; I-II) [8].
(4 hours a week and 4 hours assigned work).
Mechanical Drawing. Year (Garlock; I) [8].
(4 hours a week and 4 hours assigned work).
Sketching. Year (Magnuson; I) [4].

Photography. One sem. (Hanson; III-IV) [2].

Labor Law. One sem. (Ziskind; IV-V) [3].

Labor Problems. Year (Ziskind; IV-V) [6].

Social Legislation Seminar. One sem. (Leet; IV-V) [3].

Languages

French Conversation Seminar. Year (Sabarth; III) [6].
German Conversation Seminar. Year (Sabarth; III) [6].

Languages (continued)

Economics in French and German. Year (Bauer; V) [4].
Elementary French. Year (Humphrey; I-II) [6].
Scientific French. Year (Humphrey; III-IV) [6].
Elementary German. Year (Leineweber; I-II 102) [6].
Scientific German. Year (Leineweber; III-IV) [6].
Advanced German. Year (Leineweber; IV-V, Goethes Faust) [6].
Elementary Russian. Year (Leineweber; I-II) [6].
Advanced Russian. Year (Leineweber; III-IV) [6].
Elementary Spanish. Year (Olds; I-II) [6].
Intermediate Spanish. Year (Olds; II) [6].
Advanced Spanish. Year (Olds; III-IV) [6].
Elementary Italian. Year (Barbella; I-II) [6].
Advanced Italian. Year (Barbella; III-IV) [6].

Mathematics (See also courses in statistics)

Algebra. 1st sem. (Winslow; II Stat.262) [2].
Algebra, Linear. Year (Girshick; V) 1940-41 and every third year. [4].
Higher Algebra. 1st sem. (Finan; IV-V) This year and every third year. [3].
Trigonometry and Geometry. 2d sem. (Winslow; II Stat.262) [2].
Calculus. Year (Deming; III) 1939-40 and alternate years. [6].
Calculus of Finite Differences. 1st sem. (Deming; IV-V) This year and every third year. [3].
Calculus, advanced. Year (Wortheimer; IV-V) This year and alternate years. [4].
Theory of Infinite Processes. Year (Winston; V) 1939-40 and every third year. [4-6].
Mathematics of Investment, advanced. 1st sem. (; IV-V) This year and alternate years. [2-3]. (See also Mathematics of Finance under Accounting).
Theory of Functions. Year (Girshick; V) 1939-40 and alternate years. [4-6].

Mineralogy. Year (Glass; IV-V) [4-6] Class limited to 25.

Radio Engineering. Year (Cohen; IV-V) [4].

Morphology, genesis, and classification of soils. 1st sem. (Kellogg; V) [3].

Soil Conservation. Year (; V) [6].

Statistics (See also courses in mathematics)

Introduction to Statistical Analysis. Year (Stauber and Ockey; III, 361-362) [6].
Statistical Laboratory. Year (Aitchison; III, 361-362)
Interpretation of Statistical Calculations. Year (Sturges; IV-V, 552-553) [4].
Index Numbers and Time Series. Year (Purves; IV-V) [4].
Statistics for Biological Workers. (; IV-V) 1939-40 [4].
Statistical Treatment of Experiments in the Plant and Animal Industries. Nov.-Apr. (Brandt; IV-V) [3].

Statistics (continued)

Adjustment of Observations. Year (Deming; IV-V) 1939-40 and every third year. [6].

Least Squares. 2d sem. (Deming; IV-V) This year and every third year.

Multivariate Analysis. Year (Girshick; V) This year and every third year. [4]

Analytic Curve Fitting. 1st sem. (Sasuly; V) This year and every third year. [2].

Dynamic Analysis of Time Series. 2d sem. (Sasuly; V) This year and every third year. [2].

Special Topics in Statistics (lectures). (IV-V) [1].

Statistics Seminars (general).

Statistics Seminars (advanced).

Stenography Speed Development. Starting at 100 words per minute. (Richter and Neter) English, German, French, Dutch, Spanish and Italian.

Rural Sociology. One sem. (Taylor and Loomis; V) [2].

History of Social Thought and Theory. One sem. (Taylor and Loomis; V) [2].

Social Psychology. Year (Kaufman; IV-V) [4-6].

General Psychology. Year (Kaufman; IV-V) [6].

General Sociology. Year (Kaufman; IV-V) [6].

History of Philosophy. Year (Painter; IV-V) [6]

Survey of Public Personnel Management. coop. A.U.

Management and Supervision. coop. A.U.

Supreme Court, Current Decisions. Year (Hankin; IV-V) [4]. Seminar.

Patent Law and Procedure. One sem. (Boone; IV-V) [2].

Special Lectures. Programs arranged through the year presenting leading experts.

Extension Seminars. Year (Wilson and Joy; IV-V) [6].

1. Organization programs and projects.
2. Extension methods. Year

Filing Seminar. Year (Lucas)

General Lectures

Social Problems of Today. Fri. 5-6, Sept.-Jan (Dr. Kaufman, chairman).

Human Relations in the Light of Psychology. Fri. 5-6, Jan.-April. (Dr. Kaufman, chairman).

Other lectures to be announced later.

PUBLICATIONS

Publications available at the Graduate School

Some Notes on Least Squares, by W. Edwards Deming; price $1.50

Lectures and Conferences on Mathematical Statistics, by J. Neyman, edited by Deming; price $1.25

On The Statistical Theory of Errors, by W. Edwards Deming and Raymond T. Birge; price 35¢

Lectures on Statistics by Dr. Walter A. Shewhart of the Bell Telephone Laboratories; price 75¢

Lectures on Current Economic Problems, by various outstanding speakers in that field; price 50¢

Lectures on Discovering Ourselves: Psychology Today, by various outstanding speakers in that field; price 50¢

Lectures on Administrative Management, by various outstanding speakers in that field; price 50¢

Elements of Personnel Administration; Principles and Techniques, by various outstanding speakers in that field; price 35¢

(Postage extra)

F - L - I - E - R

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

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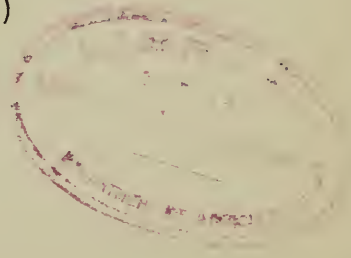

F - L - I - E - R

GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

Students desiring to take work in the Graduate School are urged to get the complete catalogue from room 4090 South Building, and to select their courses as promptly as possible. Unless otherwise arranged, registration must be completed by September 20th. Courses begin the following week.

MICROBIOLOGY (III) - Dr. Chas. Wm. Rees; Mon., Wed. and Fri., (or days to be arranged) beginning on or about September 26th (6 cr.). The course will include two lectures and one laboratory period for the week. Fee $20.00 per semester - this includes a charge for laboratory material.

The course will comprise a study of methods of investigation used in diagnosing diseases, detecting clinical symptoms, and studying post-mortem anatomy; also of the types of organisms involved and the techniques of their investigation. Opportunity will be given to examine the latest equipment in government laboratories. The laboratory will comprise special demonstrations and assignments of problems in cooperation with investigators having available equipment. The work will be given at the Bureau of Dairy Industry, Beltsville, Md. Registration limited to twenty-five students.

ECONOMICS OF AGRICULTURAL PRODUCTION (III) - Dr. R. H. Allen and Dr. Sherman E. Johnson; Mon. and Wed. at 7:30 p.m., commencing Oct. 3d. (2 cr.) Tues. and Thurs. may be substituted if desired. Fee $12.00 per semester.

First semester. This course is planned as an introduction to the course in farm management to be offered the second semester. It stresses the principles basic to the economic problems of production which are encountered in farm management, land economics, soil conservation and similar fields. It is aimed at an understanding of the economic basis of agricultural production and the development of principles of production economics as useful tools in analysis of problems with which the student is concerned.

Prerequisite - Principles of economics or its equivalent.

FARM MANAGEMENT (IV) - Drs. Sherman E. Johnson and C. L. Holmes; Mon. and Wed. at 7:30 p.m., commencing Jan. 30th. (2 cr.) Tues. and Thurs. may be substituted if desired. Fee $12.00 per semester.

Second semester. This course considers the most economic combination of resources used in farming, the combination of farm enterprises and their efficient operation on individual farms and the basis for formulation of farming programs for agricultural areas.

Prerequisite - Economics of agricultural production or its equivalent.

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UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON D. C.

October 19, 1938.

MEMORANDUM FOR CHIEFS OF BUREAUS AND OFFICES

Pursuant to the recommendation made on June 24, 1938, by a special departmental committee to consider the future of the Graduate School, there is hereby established the General Administration Board for the Department Graduate School.

This Board shall meet regularly, at least quarterly; and its functions shall include; Review and approval of the program and curriculum of the School; the preparation of an annual report to the Secretary, including a financial statement; recommendation to the Secretary of persons to serve as Director and Assistant Directors of the Graduate School; planning the future development of the School in an effort to serve as fully and effectively as possible future departmental needs.

The General Administration Board is authorized to formulate its own by-laws, rules and procedures for carrying out the functions enumerated above, and such others as are generally recognized as within the scope of such a board. The following are appointed as members of the General Administration Board:

Roy F. Hendrickson, Director of Personnel, Chairman
James T. Jardine, Director of Research
H. R. Tolley, Chief, Bureau of Agricultural Economics
Henry G. Knight, Chief, Bureau of Chemistry & Soils
E. C. Auchter, Chief, Bureau of Plant Industry
Peter Keplinger, Forest Service
Winston B. Stephens, Farm Security Administration
A. G. Black, Director, Marketing and Regulatory Work
W. W. Stockberger, Special Adviser to the Secretary.

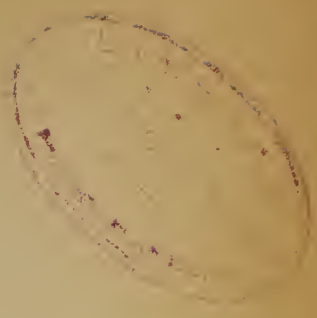
LIBRARY
BUREAU OF AGRICULTURAL ECONOMICS
DEPARTMENT OF AGRICULTURE

Harry L. Brown
Acting Secretary

THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE
WASHINGTON

PROBLEMS IN THE ADJUSTMENT OF PERSONALITY

A Course of Ten Lectures
Fridays at 5
In the Auditorium, South Building
Beginning January 6th, 1939



The Subjects and the Speakers:

What Is the Effectively Adjusted Personality — Jan. 6
Dr. Homer P. Rainey, Director, American Youth Commission, American Council on Education

Making the Best of Our Nerves — Jan. 13
Dr. Esther L. Richards, Associate Professor of Psychiatry, Johns Hopkins University

Getting Along With Our Emotions — Jan. 20
Dr. Karl M. Bowman, Director of the Division of Psychiatry, Bellevue Hospital, New York; Professor of Psychiatry, New York University College of Medicine.

Finding Freedom From Fear and Worry — Jan. 27
Dr. John R. Oliver, Associate in the History of Medicine, Johns Hopkins University; sometime Psychiatrist, Johns Hopkins Hospital

Educating Ourselves in the Problems of Sex — Feb. 3
Dr. Winifred V. Richmond, Psychologist, St. Elizabeths Hospital, Washington

Adjustments in Marriage and Family Relations — Feb. 10
Dr. Joseph K. Folsom, Professor of Sociology, Vassar College

Adjustment in Relation to the Unconscious — Feb. 17
Dr. Kenneth E. Appel, Psychiatrist, The Institute of the Pennsylvania Hospital; Associate Professor of Psychiatry, Medical School, University of Pennsylvania

Adjusting Ourselves to the Daily Work — Feb. 24
Dr. Walter V. Bingham, Director, Personnel Research Federation, New York

Adjustment and Social Attitudes — March 3
Dr. Goodwin Watson, Professor of Education Teachers College, Columbia University

The Problem of Adjusting the Whole Personality — March 10
Dr. Hornell Hart, Professor of Sociology, Duke University

Dr. Paul Kaufman, Chairman of Lecture Series in the Social Sciences, will preside. (Enrollment fee, $4.00)

THE DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

EDUCATIONAL COURSES MAKING FACILITIES AVAILABLE FOR STUDY AND RESEARCH

in the

GOVERNMENT SERVICE

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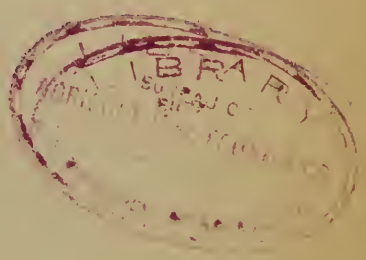

SECOND SEMESTER

1938-39

WASHINGTON

THE DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

COURSES FOR THE SECOND SEMESTER 1938-39

Second semester commences January 30th, 1939

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The courses for the year were outlined in full in the catalog issued September 1938. Some additional courses not appearing in that catalog are included here with a few corrections and changes. The tuition will be $12 per semester for two hour a week studies and $18 a semester for three hour a week studies, except as otherwise indicated. Those who desire college or graduate credits certified to a university or to the Civil Service Commission will pay $7.50 per credit hour. Students withdrawing from classes after the second week will not be entitled to a cash refund; until the end of the second week, anyone withdrawing from a class is entitled to the return of his fee, minus a $3 charge which is retained as the average per capita expense attached to each registration. An exception is made in the case of students withdrawing from a class that is continued with fewer than fifteen students; no refund at all is then granted. But if an announced course is not given for want of the minimum number of students (15), money paid will be returned in full.

REGISTER IN ADVANCE. No one will be admitted to class without a registration card. Registrations for the second semester should be completed before January 25th.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is fifteen, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

Special series of lectures not included in this preliminary statement will be announced from time to time as plans for them are completed.

The latest catalogs of universities and colleges are available for consultation in the Office of the Director, room 4090 of the South Building. Inquiries regarding the school should be addressed to

A. F. Woods
Director of the Graduate School, Room 4090
The Department of Agriculture
Washington

Room assignments for classes may be obtained from the Director's Office after January 14th.

Any student working for academic credit should secure from the schools attended a transcript of his academic record and file it with the Secretary at the time of registration.

AUTHORITY AND OBJECTIVES

The Congress of the United States has enacted special provision for making the facilities for study and research in the government departments available to qualified individuals, students, and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of Departments and Bureaus may prescribe (Joint Res. April 12, 1892-27 Stat. 395; Deficiency Act of March 3, 1901-31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act, a School of Graduate Studies was organized with the approval of the Secretary of Agriculture in 1921 for the benefit of Department employees and such others as are qualified to undertake the work offered.

RES. April 12, 1892, No. 8 (27 Stat. 395)

"Whereas, large collections illustrative of the various arts and sciences and facilitating literary and scientific research have been accumulated by the action of Congress through a series of years at the national capital; and

"Whereas it was the original purpose of the Government thereby to promote research and the diffusion of knowledge, and is now the settled policy and present practice of those charged with the care of these collections specially to encourage students who devote their time to the investigation and study of any branch of knowledge by allowing to them all proper use thereof; and

"Whereas it is represented that the enumeration of these facilities and the formal statement of this policy will encourage the establishment and endowment of institutions of learning at the seat of Government, and promote the work of education by attracting students to avail themselves of the advantages aforesaid under the direction of competent instructors; Therefore,

"Resolved, *** That the facilities for research and illustration in the following and any other Governmental collections now existing or hereafter to be established in the city of Washington for the promotion of knowledge shall be accessible, under such rules and restrictions as the officers in charge of each collection may prescribe, subject to such authority as is now or may hereafter be permitted by law, to the scientific investigators and to students of any institution of higher education now incorporated or hereafter to be incorporated under the laws of Congress or of the District of Columbia, to wit:

One,	of the Library of Congress.
Two,	of the National Museum.
Three,	of the Patent Office.
Four,	of the Bureau of Education.
Five,	of the Bureau of Ethnology.
Six,	of the Army Medical Museum.
Seven,	of the Department of Agriculture.
Eight,	of the Fish Commission.
Nine,	of the Botanic Gardens.
Ten,	of the Coast and Geodetic Survey.
Eleven,	of the Geological Survey.
Twelve,	of the Naval Observatory.

ACT March 3, 1901, c. 831 (31 Stat. 1010-1039)

"*** That facilities for study and research in the Government Departments, the Library of Congress, the National Museum, the Zoological Park, the Bureau of Ethnology, the Fish Commission, the Botanic Gardens, and similar institutions hereinafter established shall be afforded to scientific investigators and to duly qualified individuals, students, and graduates of institutions of learning in the several States and Territories, as well as in the District of Columbia, under such rules and restrictions as the heads of the Departments and Bureaus mentioned may prescribe."

In accordance with the purposes of the Government as above enumerated, the collections and laboratories of the Department of Agriculture from their foundation have been made available to qualified students and investigators as far as it was possible to do so. Many workers from American and foreign universities and colleges have availed themselves of these privileges.

The Graduate School of the Department was organized in 1921. Secretary Henry C. Wallace in his report for 1921 said: "To maintain the efficiency in a scientific organization under Civil Service regulations some provision must be made for adequate training of those who enter the service in the lower positions. *** To meet this need the Department has provided for graduate training in various lines for the scientific workers. The work is given outside of office hours, is supported entirely by the students, and is therefore unofficial in nature. It is, however, supervised and encouraged by the Department. Everything necessary is done to insure the highest standard for the work, so that it will

not only be effective training for the Department workers, but satisfactory to the graduate institutions of the country. It is expected that the ambitious workers of the Department will make arrangements with such graduate institutions for the acceptance of these credits and will ultimately attend these institutions and complete any work required for advanced degrees."

Some of the strongest scientists of the government departments are taking charge of courses and a few of the leading graduate institutions in and near Washington have furnished teachers for others. The professional staffs of the various bureaus are mostly in the Civil Service and hold their positions by reason of merit. Most of them were originally drawn from the staffs of the leading colleges and universities, and are now practicing the subjects that they teach. Altogether a most helpful spirit has prevailed. The interest in the school has grown from year to year. Its work has been strengthened and credits granted have been accepted for graduate and undergraduate credit in all institutions where they have been offered. These include most of the leading universities of the country and the Civil Service Commission.

As the work developed it became increasingly necessary to offer courses in the undergraduate levels to enable students to work out programs acceptable to graduate schools in which the student desires to register for an advanced degree. The course levels are indicated in the catalog by Roman numerals e.g., I, freshman; IV, senior; V, graduate.

Students are urged to register for work desired in local colleges when practicable. By special arrangements with some nearby institutions, especially American University, cooperative courses are organized and are available for residence credit. These are indicated by an asterisk (*). Every effort is made to insure the highest possible standard of work, so that it may be satisfactory to the government service and cooperating colleges.

Graduate credit can be obtained only by persons having a bachelor's degree from an accredited college, and undergraduate credit only by those who have fifteen units of standard work from an approved high school. Classes meeting two clock hours per week for fifteen weeks carry two semester credits; those meeting three hours carry three semester credits. Classes running through the year earn double this number, i.e., four or six semester credits respectively. Only courses marked III, IV, V may be used in graduate programs, those marked III and IV for minors, V for majors. Courses in the first and second levels (I and II) may be required without credit if necessary for foundation training.

Work for the master's degree is largely "resident" work at the institution where the degree is to be taken. Not more than six units, as a rule, may be taken at another institution.

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The Department Library in room 1052 will be open from 4:30 till 6 on Fridays for students who can not conveniently go there during the regular hours.

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PUBLICATIONS OF THE GRADUATE SCHOOL

		Price	Postage U.S.	Postage Foreign
ON LEAST SQUARES by W. Edwards Deming		$1.50	3¢	15¢
LECTURES AND CONFERENCES ON MATHEMATICAL STATISTICS by J. Neyman, edited by W. Edwards Deming		$1.25	3¢	13½¢
ON THE STATISTICAL THEORY OF ERRORS by W. Edwards Deming and Raymond T. Birge		35¢	1½¢	4½¢
LECTURES ON STATISTICAL METHODS by Walter A. Shewhart		$2.25	3¢	12¢
ADMINISTRATIVE MANAGEMENT by outstanding leaders in that field	paper binding cloth binding	75¢ $1.00	1½¢	7½¢
CURRENT ECONOMIC PROBLEMS by outstanding leaders in that field		50¢	4½¢	22½¢
ELEMENTS OF PERSONNEL ADMINISTRATION by outstanding leaders in that field		50¢	1½¢	4½¢
UNDERSTANDING OURSELVES: A SURVEY OF PSYCHOLOGY TODAY by outstanding leaders in that field		50¢	3¢	12¢

Cheques accepted, U. S. and British stamps accepted.

INDEX OF COURSES

	Page
Accounting	
Accounting, Principles of	1
Accounting, Second Year	1
Accounting, Income Tax Law	2
Accounting in the Field of Legal Problems	2
Auditing	2
Mathematics of Finance	1
Botany	
Botanic Research, History of	3
Botany, Systematic	2
Plant Breeding with Special Reference to Disease Resistance	2
Plant Ecology	2
Chemistry	
Inorganic Chemistry, Advanced	3
Organic Chemistry, Advanced	3
Organic Chemistry, An Introduction to	3
Physiological Chemistry	3
Cotton	
Cotton Classing	11
Cotton Marketing	11
Economics	
Agricultural Credit in the United States	6
Agricultural Price-Making Forces and Processes	5
Contemporary Economic Problems	4
Current Social Legislation	5
Economics, Principles of	4
Farm Management	6
Foreign Trade Problems and Policies in Relation to Agriculture	5
History of Economic Thought	5
International Trade	5
Money and Banking	5
Social and Economic History of American Agriculture	4
The Development of English Economic and Governmental Institutions	4
Editing	
Editing Manuscripts on Agriculture, Home Making and Related Subjects	7
English	
Applied English Grammar	7
Composition and Rhetoric	6
Descriptive English Grammar	7
Dictionary Study	6
Effective Speaking	6
English Literature Since 1800	7
English Novel	7
Fundamentals of Speech	6
Government Correspondence	6
Introduction to the Art of Thinking	7
Play Writing and Play Production	8
Preparation and Presentation of Public Addresses	8
Rural Novel	7
Seminar in Creative Writing	7
Extension Seminars	11

Page

Farm, The Self-Contained 11

Filing Seminar 11

Forests, The Non-Commodity Use of 12

French (see also Languages)
Advanced Scientific French. 10
Conversational Seminars in French 10
Elementary Scientific French 10

General Lectures. 18

Geography and Meteorology
Introduction to Methods of Quantitative Geography 8
Meteorology and Climatology 8
Dynamic Meteorology 8
Aerial Photography 8

German (see also Languages)
Advanced and Technical German. 10
Conversational Seminars in German 10
Elementary German. 10

Glass Blowing. 12

Graphic Presentation
Architectural Drawing, Elementary and Advanced 9
Blueprint Reading. 9
Freehand Drawing and Sketching 9
Mechanical Drawing 9

History; Recent History of the United States 12

Italian, Elementary. 10

Languages (see also French, German, Italian, Russian, and Spanish)
Conversational Seminars in French and German. 10
French, Advanced Scientific 10
French, Elementary Scientific. 10
German, Advanced and Technical 10
German, Elementary 10
Italian, Elementary 10
Russian, Elementary 10
Russian Literature, Lectures on (in English). 10
Spanish, Beginning 10
Spanish Conversation and Composition 10

Law
A Seminar Course on the Current Decisions of the Supreme Court. . . . 11
Current Social Legislation (see also Economics). 5
Income Tax Law. 2
Labor Problems and Programs 11
Labor Law and Legislation 10
Patent Law and Procedure 11

Mathematical Preparation for Statistics (see also Statistics)
Advanced Calculus. 13
Algebra 13
Calculus 13
Higher Algebra. 13
Trigonometry and Geometry 13

(continued on the next page)

Page

Mathematics, continued from the preceding page
Linear Algebra 13
Mathematics of Finance 1
Mathematics of Investment 13
The Calculus of Finite Differences 13
Theory of Functions 13
Theory of Infinite Processes 13
Interpolation, Approximation, and Mechanical Quadrature 13

Meteorology (see Geography and Meteorology)

Mineralogy, Descriptive. 12

Philosophy, Psychology, and Sociology
Current Social Problems 18
General Psychology. 17
History and Philosophy of Science. 18
History of Philosophy. 17
Principles of Rural and Urban Sociology 17
Problems in Personality Adjustment 18
Rural Social Psychology 17
Social Psychology 17

Photography
Basic 12
Aerial Photography and Cartography 8

Psychology (see Philosophy, Psychology, and Sociology)

Radio Engineering. 12

Russian (see also Languages)
Elementary Russian. 10
Lectures on Russian Literature (in English) 10

Spanish (see also Languages)
Beginning Spanish 10
Spanish Conversation and Composition 10
Stenography in Spanish 16

Sociology (see Philosophy, Psychology, and Sociology)

Soils
Soils: Their Morphology, Genesis, and Classification 12
Soil Conservation 12

Statistics (see also Mathematics)
Adjustment of Observations 15
Analytic Curve Fitting 16
Correlation Analysis 15
Dynamic Analysis of Time Series 16
Graphic Methods Applied to Research Analysis 14
Index Numbers and Time Series Analysis 15
Interpretation of Statistical Calculations. 15
Introduction to Statistical Analysis 14-15
Least Squares 15
Multivariate Analysis. 16
Seminars in Statistics 14
Special Topics in Statistics 16

(continued on the next page)

Statistics, continued from the preceding page
Statistical Treatment of Experiments in the Plant and Animal Industries 15
Statistics for Biological Workers 15
Statistics Laboratory 15
Theory and Application of the Characteristic Function 16

Stenography
Stenography in Spanish 16
Shorthand Speed Reporting 16

DETAILED DESCRIPTION OF COURSES

The asterisk (*) indicates cooperation with American University

Roman numerals indicate college year levels

ACCOUNTING

(Undergraduate)

PRINCIPLES OF ACCOUNTING (I) - Dr. Oswald Nielsen, Messrs. Wm. H. Rowe, Edwin J. Johnson, and George Y. Jarvis; Tues. and Thurs. at 5 commencing Jan. 31st. (2-3 cr.)

First semester. Elementary principles and procedures of accounting; discussion and problems. At the end of the semester the student will be prepared to devise the accounting records necessary for a small business organization, make the necessary entries in the records, draw off statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

PRINCIPLES OF ACCOUNTING (I) Continuation of the first semester. Tues. and Thurs. at 5 commencing Jan. 31st. (2-3 cr.)

More advanced principles of accounting; determination of income under special circumstances; the valuation of assets and depreciation policies, manufacturing accounts, partnership accounts, and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

A two hour LABORATORY PERIOD once a week is required for students taking the course for credit unless specially excused by the instructor in which event only four hours credit will be given for the course. ACCOUNTING FIRST SEMESTER laboratory will meet on Tuesdays from 6 to 8; ACCOUNTING SECOND SEMESTER laboratory will meet on Thursdays from 6 to 8.

* SECOND YEAR ACCOUNTING (II) Continuation of the first semester. Fri. from 5 to 7:30 commencing Feb. 3d. (3 cr.)

This course will include such topics as the correction of financial statements and books of account, comparative statements and the analysis of financial statements by means of financial and operating ratios and statements of sources and application of funds, statements of affairs, receivers' accounts, realization and liquidation accounts, home office and branch accounting, and consolidated statements. Considerable emphasis will be given to the solution of problems in connection with such topics.

Prerequisite: First year accounting or its equivalent.

MATHEMATICS OF FINANCE (II) - Mr. Wm. H. Rowe; Tues. and Thurs. at 5 commencing Jan. 31st. (2-3 cr.)

Calculation of compound interest, compound discount, sum of annuities, present value of annuities and perpetuities; determination of annual payments necessary to accumulate sinking funds and to amortize debts by installments and preparation of schedules for such accumulations and amortizations. The valuation of bonds in cases where the yield rate differs from the bond rate and the preparation of schedules for the amortization of premiums or accumulations of discounts on such bonds. Computation of depreciation by the sinking fund method, the fixed percentage of book value method, and other methods, as well as the preparation of schedules for the same will be included. Some study will be given to life probabilities, and the computation of premiums for the simpler types of life annuities and life insurance.

This course is given primarily for students of accounting, but others will be admitted. The application to accounting will be reserved until the last third of the semester. For students not taking the accounting applications the course will run for ten weeks with two hours credit; for accounting students the course will continue five additional weeks and give three hours credit. Problems will include those of types given in C.P.A. examinations.

Prerequisites: Algebra; and for students taking the three hour course, one year of accounting. (See also a more advanced course under Mathematics.)

(Graduate and advanced undergraduate)

* INCOME TAX LAW (IV) - Mr. Geo. B. Clark; Fri. from 5 to 7:50 commencing Feb. 3d. (3 cr.)

This will be a study of the Federal Income Tax Acts and their administration from the standpoint of tax returns. The several forms used for the income tax returns are analyzed. Detailed study is made of the various kinds of income exemptions and deductions.

Prerequisite: First year accounting or its equivalent.

ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (IV,V) Continuation of the first semester. Mr. Mark S. Massel; Tues. and Thurs. at 5 commencing Jan. 31st. (3 cr.)

This course is designed to present significant accounting concepts in the field of legal problems by the case method. Purposive character of accounting; balance sheets, assets, liabilities, capital. Income and profit and loss statements. Reserves and deferred assets. Aspects of fraud, taxation, and public utility regulation. Cost accounting methods; labor, material, and overhead. Accounting problems in trade regulation: legislative and administrative regulation, including prohibitions against sales below cost, loss-leader limitations, and the Robinson-Patman anti-discrimination act. Legal procedures: criminal sanctions, cease and desist orders, civil suits, arbitration.

Prerequisite: Two years of law, or permission of the instructor.

* AUDITING (IV, V) - Instructor to be announced; Wed. from 5 to 7:30 commencing Feb. 1st. (3 cr.) Course to be given at 1901-7 F St., N.W.

This course will deal with the purposes and types of audits. Consideration will be given to such problems as the planning and performing of audits, principles of auditing of the various accounts and procedures under different types of audits, audit working papers and reports, and responsibility of the auditor.

Prerequisite: First year accounting or its equivalent.

BOTANY

(Undergraduate)

SYSTEMATIC BOTANY (II) Continuation of the first semester. Dr. S. F. Blake; Mon. and Wed. at 4:50 commencing Jan. 30th. (2 cr.)

This course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

(Graduate and advanced undergraduate)

PLANT ECOLOGY (IV,V) - Dr. M. B. Waite; Mon., Wed., and Fri. at 4:50 commencing Jan. 30th. (2 cr.) The first semester of this course will be given if ten students register.

First semester. (Ten weeks) General plant ecology. The general principles of plant ecology, including the soil, climatic, and biotic factors influencing the principal native plant formations of the United States and the principal crop-plant regions. The ecology of cultivated crop plants will be stressed. The viewpoint of plant ecology, methods of study, and observations bearing on problems in botany and phytotechny will be developed.

The second semester will be given next September (ten weeks). The ecological factors will be discussed in relation to the non-parasitic, the virus, and the parasitic diseases of plants. The ecology of insect transmission of diseases will be considered. The ecology in health and disease of the leading crop plants will form a major part of the course.

Prerequisites: A general knowledge of botany and of agriculture.

PLANT BREEDING WITH SPECIAL REFERENCE TO DISEASE RESISTANCE (V) - Dr. F. J. Stevenson, assisted by other specialists, not given until 1939-40.

Prerequisites: B. S. degree in botany or related subject.

HISTORY OF BOTANIC RESEARCH (IV, V) Continuation of the first semester.- Dr. O. F. Cook; Tues. and Thurs. at 4:50 commencing Jan. 31st. (2 cr.)

The second semester will continue the general survey of human interest in the plants of the world. Origins and histories of cultivated plants in relation to development of civilization, including recent domestications and introductions to new regions. Effects of agriculture on native vegetation, and eventual limitation or extinction of advanced races by deforestation, denudation, and erosion of cultivated areas and "waste" lands. Methods and results of botanic study in the scientific period. Special research courses in historic treatment of biologic problems of the plant world may be arranged for advanced students working in libraries, collections, or laboratories, on approval of training, experience, subjects and plans of investigation, for theses and other publications.

CHEMISTRY#

(Undergraduate)

AN INTRODUCTION TO ORGANIC CHEMISTRY (II) Continuation of the first semester. Dr. E. P. Clark; Tues. and Thurs. at 4:50 commencing Jan. 31st. (2 cr.)

The fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be adequately considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester was devoted to the consideration of the aliphatic series; in the second semester the aromatic and heterocyclic series will be taken up.

(Graduate and advanced undergraduate)

ADVANCED ORGANIC CHEMISTRY (IV, V) Continuation of the first semester. - Dr. W. Gordon Rose; Tues. and Thurs. at 4:50 commencing Jan. 31st. (2 cr.)

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins, and sex hormones will be given.

Prerequisites: A year of organic chemistry and a year of physics.

INORGANIC CHEMISTRY, ADVANCED (IV,V) - Dr. James I. Hoffman; not given until 1939-40. (2 cr.)

PHYSIOLOGICAL CHEMISTRY (IV,V) Continuation of the first semester. - Dr. Herbert O. Calvery; Tues. and Thurs. from 7:45 to 8:45 a.m. commencing Jan. 31st. (2 cr.)

Second semester. Metabolism of the proteins, fats, and carbohydrates, mineral metabolism; the chemical constituents of the urine, and finally a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

These courses will be supplemented by laboratory if credit is desired.

ECONOMICS

(Undergraduate)

PRINCIPLES OF ECONOMICS (II) Continuation of the first semester. - Dr. E. W. Braun; Mon. and Wed. at 5 commencing Jan. 30th. (2-3 cr.)

This course is designed to serve students who wish a foundation for advanced economic theory, and students who wish to link quantitative analysis with economic principles. Emphasis will be placed upon the relation between economic principles and tendencies and frequency distributions, and time series including index numbers. The first semester was devoted to questions relating to value. Illustrative material will be drawn mainly from agricultural economics. The second semester will be devoted to a treatment of distribution of income and other subjects, such as money and banking, business cycles, and institutional economics, depending upon the available time and desires of the students.

* SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (II, III) Continuation of the first semester. - Mr. Everett E. Edwards; Tues. and Thurs. commencing Jan. 31st. (2-3 cr.)

Second semester. Agriculture's relation to the sectional struggle; the agricultural revolution, its elements and significance; policies concerning the public domain since 1862; agrarian settlement since 1850, especially in the trans-Mississippi West; history and significance of farm implements and machinery; transportation facilities with reference to agricultural conditions; development of domestic and foreign markets; agencies promoting agriculture, agricultural education, State and Federal departments; agriculture since 1860 by regions and commodities; American agriculture during the World War; the cooperative movement; rural population and tenancy changes and tendencies.

No prerequisites.

(Graduate and advanced undergraduate)

* CONTEMPORARY ECONOMIC PROBLEMS (II) Continuation of the first semester. - Dr. Max J. Wasserman; Tues. and Thurs. at 5 commencing Jan. 31st. (2 cr.)

The theoretical and practical aspects of the major economic problems confronting us at the present time. Each problem will be placed in its historical setting showing how it takes its roots in the past developments of economic society. The problems that will be treated are

I. Capitalism, its improvement and substitute economic organizations
II. Selected labor problems
III. Selected problems in fields of money, banking, and credit
IV. Selected agricultural problems
V. The federal regulation of business

THE DEVELOPMENT OF ENGLISH ECONOMIC AND GOVERNMENTAL INSTITUTIONS (II,III) - Dr. W. L. Slifer; Tues. and Thurs. at 5 commencing Jan. 31st. (2 cr.) To be given if ten students register.

This course gives a background for training in the social sciences. The origin and development of economic and governmental institutions by our English ancestors are presented. The changes in the methods used by the people in earning their livelihood from the early days of English history to the present are stressed throughout the course. This includes the various phases of agriculture, commerce, and industry. Special attention is given to the early guilds, fairs, and markets. The development of foreign trade, the industrial revolution, and modern industry are described. The great landmarks, such as the Magna Charta, the Petition of Rights, and the Bill of Rights, are analyzed to give the proper background for an understanding of the American Constitution.

The second semester will be given next fall.

* AGRICULTURAL PRICE-MAKING FORCES AND PROCESSES (V). - Drs. O. C. Stine and F. L. Thomsen. For further details communicate with the Office of the Graduate School. Course to be given at 1901-7 F Street.

A discussion of price-making forces; factors determining the supply in the market and the demand for a commodity as influencing prices; other conditions affecting prices, such as contract, custom, monopoly, administrative agreements, and legislation; wholesale, retail, and future market price relationships; the business cycle and the general price level. This will be conducted as a combination seminar and lecture course.

HISTORY OF ECONOMIC THOUGHT (II,III) Continuation of the first semester. - Dr. Max J. Wasserman; Mon. and Wed. at 5 commencing Jan. 30th. (2 cr.)

Special attention will be devoted to the following schools of thought and authors: Greek antiquity: Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresme. The Mercantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Pont, Riviere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill. The Socialists: LaSalle, Marx, Proudhon. The German Historical School: Knies, Hillebrand, Wagner. The Austrian School: Von Wieser, Bohm-Bawerk, Jevons, Walras. The Neo-Classical School: Alfred Marshal. Recent and modern developments — institutional, quantitative, and welfare economics.

MONEY AND BANKING (II,III) Continuation of the first semester. - Dr. Max J. Wasserman; Fri. from 7 to 9 p.m. commencing Feb. 3d. (2 cr.)

Money - medium of exchange, functions of money, history of the United States coinage, paper money, the money system of the United States, value of money and prices, credit. Banking - origin and development of banking, banking development in the United States, functions of the bank, national banking system, administration, deposits and depositors, clearing house, domestic and foreign exchange, loans and discounts, bank supervision, savings banks, trust companies, foreign banking systems, defects of national banking systems, Federal Reserve system, the Agricultural Credit system.

*CURRENT SOCIAL LEGISLATION (IV,V) - Mr. Glen Leet; Fri. from 5 to 7:30 commencing Feb. 3d. (3 cr.)

The field covered will include social legislation currently under Congressional consideration and will include social security, old age insurance, unemployment compensation, public assistance, health insurance; child welfare; unemployment and relief; public health, child and maternal health, venereal disease control, cancer control.

This course will be conducted on a seminar basis with a limited enrollment. There will be occasional guests present with special knowledge of particular problems considered. Reports of hearings before Congressional committees and reports of executive agencies will be used extensively as source material.

*FOREIGN TRADE PROBLEMS AND POLICIES IN RELATION TO AGRICULTURE (IV,V) Continuation of the first semester. - Mr. L. A. Wheeler; Mon. and Wed. at 4:50 commencing Jan. 30th. (2 cr.)

The object of this course is to present for discussion and analysis certain fundamental aspects of the foreign trade trends and policies of the United States and of the agricultural policies of foreign countries as they relate to American agriculture. One or two lectures on international trade theory will be given and selected readings assigned early in the course to provide a general background. The course is intended primarily for graduate students who have already some training in theory.

INTERNATIONAL TRADE (IV,V) Continuation of the first semester. - Drs. James P. Cavin and Bennett S. White; Fri. from 5 to 7 p.m. commencing Feb. 3d. (2 cr.)

Recent developments in international trade theory; realistic approach to the doctrine of comparative advantage in interregional and international exchange. Mechanism and theory of international trade; past and contemporary experience; trade developments in the future.

Prerequisites: An undergraduate major in economics, or the consent of the instructors.

* AGRICULTURAL CREDIT IN THE UNITED STATES (IV,V) - Mr. Fred L. Garlock; Fri. from 5 to 7:30 commencing Feb. 3d. (3 cr.)

The financial requirements of agriculture and the methods by which the industry is financed. In part historical, the course will follow the evolution of the financial mechanism for supplying farm credit, the historical changes in the use of credit in agriculture, and the movement of the farm debt. Principal attention, however, will be devoted to the present financial conditions and requirements of farmers and to the modern mechanism for supplying them with credit. The underlying principles upon which agricultural financing is now conducted will be analyzed.

* FARM MANAGEMENT (IV) - Drs. Sherman E. Johnson and C. L. Holmes; Tues. and Thurs. at 7:30 p.m. commencing Jan. 31st. (2 cr.)

The most economic combination of resources used in farming, the combination of farm enterprises and their efficient operation on individual farms and the basis for formulation of farming programs for agricultural areas.

Prerequisite: Economics of agricultural production or its equivalent.

ENGLISH

(Undergraduate)

FUNDAMENTALS OF SPEECH (I) - Hester Beall Provensen; Tues. from 5 to 7 commencing Jan. 31st. (2 cr.)

Elementary speech training, specific to individual needs, based upon diagnostic study of individual differences and abilities. Training embraces the development of distinct utterance, voice improvement and speech in every-day social and business relationships. Each student speaks at every class meeting receiving specific and constructive criticism. Stress is placed upon vocabulary building.

EFFECTIVE SPEAKING (II) - Hester Beall Provensen; Thurs. from 5 to 7 commencing Feb. 2d. (2 cr.) A student may enroll for one or both of the following sections:

Section 1 (1 cr.) - Thurs. from 5 to 6, SPEECH IMPROVEMENT. An intensive course for those desiring to improve their speaking voices and increase their vocabularies. Pronunciation is taught on a phonetic basis.

Section 2 (1 cr.) - Thurs. from 6 to 7, PUBLIC SPEAKING. The preparation and delivery of original speeches, speeches for special occasions, and the intelligent reading of script intended for radio presentation.

Enrollment limited to twenty students. (A more advanced course is listed on page 8- Preparation and Presentation of Public Addresses.)

GOVERNMENT CORRESPONDENCE (II) - A course similar to that offered in the fall semester may be arranged if there is sufficient interest; inquiries are invited and may be made by telephone, but preferably in writing. Final announcement will be made later.

DICTIONARY STUDY (I) - Sallie M. Pease; Fri. from 5 to 7 commencing Feb. 3d. (2 cr.)

This course is to encourage a more intelligent appreciation of the value of dictionaries. Special attention will be directed to pronunciation, syllabication, accent, definitions, etymology, synonyms, antonyms, homonyms, idiomatic phrases and redundances, orthography, etc.

COMPOSITION AND RHETORIC (I) - Dr. Susan E. Harman; Thurs. from 5 to 7 commencing Feb. 2d. (2 cr.)

First quarter freshman English. An introductory course in writing and English usage, designed especially for those who need a course preparatory to the more advanced English courses. Special attention will be given to the fundamental principles and mechanics of good writing: grammar, punctuation, spelling, etc.

SEMINAR IN CREATIVE WRITING (III) - Mr. Edward M. Barron; Tues. and Thurs. at 5 commencing Jan. 31st. (2 cr.)

The work in the seminar is devoted to journalistic and creative writing. Detailed analyses are made of trends and current forms of the trade and the feature article, the familiar essay, the short story, the novelette, and the novel as developed in modern publications. The primary concern is with the artistry of words, facility of expression, and the mechanics of the various forms. The student's inclinations in literary work are studied and he is encouraged to develop along the paths where his natural talents lie. The course presupposes a fundamental knowledge of composition and rhetoric.

AN INTRODUCTION TO THE ART OF THINKING (I) - Cecile Willink; Fri. from 5 to 7 commencing Feb. 3d.

The course embraces training in consecutive, clear, concise thinking through précis-writing; vocal interpretation. Impression and expression. The first hour will be devoted to précis-writing, and the second hour will be devoted to the vocal interpretations largely of the poems studied. The students will also be called upon from time to time for brief talks on the subjects studied.

(Graduate and advanced undergraduate)

DESCRIPTIVE ENGLISH GRAMMAR (III,IV) - Dr. Susan E. Harmon; Mon. from 5 to 7 commencing Jan. 30th. (2 cr.)

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

APPLIED ENGLISH GRAMMAR (III,IV) - Dr. Susan E. Harman; Wed. from 5 to 6 commencing Feb. 1st. (1 cr.)

Application of the principles of grammar in practical writing. Open only to students who have had the course in English grammar.

ENGLISH LITERATURE SINCE 1800 (IV,V) Continuation of the first semester. - Mr. Albert S. Kerr; Tues. and Thurs. at 4:50 commencing Jan. 31st. (2 cr.)

A rapid survey of the main currents in English literature since the Romantic Movement, both poetry and prose, with emphasis on the economic, sociological, and philosophical tendencies and their effects on present times. Beginning with Wordsworth, the course will treat the outstanding writers of the nineteenth century, to be followed by a study of twentieth century developments. Readings, lectures, discussions, and analyses of a few important works with supplemental reading in the novel and the drama.

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING AND RELATED SUBJECTS (IV,V) - Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information. Not given until 1939-40.

THE ENGLISH NOVEL (IV,V) Continuation of the first semester. - Mr. Albert S. Kerr. Mon. and Wed. at 4:50 commencing Jan. 30th. (2 cr.)

Beginning with the late Victorians, Hardy and Meredith, the course will treat developments during the last sixty years, particularly the extension of the realistic method under the influence of Continental writers and the new psychology.

The emphasis throughout will be upon content, philosophical, political, economic, religious, and sociological, but significant changes in technique will be noted, along with the effects of changing modes of publication and distribution. The course will be conducted in lectures and discussions, with a rapid reading of numerous novels. Text recommended: Pelham Edgar, The Art of the Novel, College Edition, (Macmillan, 1933).

RURAL NOVEL (IV,V) - Miss Caroline B. Sherman; Wed. from 5 to 7 commencing Feb. 1st. (2 cr.)

Reading and discussion chiefly, with occasional lectures. Review of the development of rural fiction in America; attention to the times and tracing the characteristics of each decade. A study of the adequacy of our later rural fiction by tests of timeliness, regional influences, social and economic influences, besides the tests usually applied to studying a literature.

PREPARATION AND PRESENTATION OF PUBLIC ADDRESSES (IV,V) - Mr. Knute E. Carlson; Fri. from 5 to 7 commencing Feb. 3d. (2 cr.)

This course will give special attention to collection, organization, and logical presentation of subject matter with various definite objectives in view.

Prerequisite: Basic public speaking or its equivalent.

PLAY WRITING AND PLAY PRODUCTION (IV,V) - Miss Rebecca Dial; Tues. and Fri. at 5 commencing Jan. 31st. (2 cr.)

First semester. Play writing - technique of writing a one-act play, selecting the plot germ, development of plot, characterization, dialogue and preparation of manuscript for the producer. Criticism of scripts.

Second semester (to be given next year). Play production - selecting, casting, and technique of producing short scenes or one-act plays.

This course is designed especially to help extension workers who desire to use this type of educational procedure.

GEOGRAPHY and METEOROLOGY

(Graduate and advanced undergraduate)

* INTRODUCTION TO METHODS OF QUANTITATIVE GEOGRAPHY (IV,V) Continuation of the first semester. - Dr. John Kerr Rose; Tues. from 5 to 7 commencing Jan. 31st. (2 cr.)

Several important sections of the field of geography will be surveyed, including population distribution, agricultural geography, land utilization and climatology. The general approach will be that of the recognition and definition of problems that can be studied by quantitative techniques; survey of quantitative contributions that have been made thereto. Specific application and utility of descriptive statistics, correlations and sampling techniques. Areal indices and measures of association applied to data having spatial distribution.

Although an acquaintance with the field of geography and a working knowledge of statistics are both highly desirable for the prospective student, the statistical techniques used will be introduced and taught as needed.

METEOROLOGY AND CLIMATOLOGY (III,IV) - Dr. Horace G. Byers will be in charge, assisted by Messrs. H. Wexler, C. H. Pierce, and other experts of the Weather Bureau. A portion of the course will be given by Commander W. M. Lockhart of the Navy. Dr. C. W. Thornthwaite of the Soil Conservation Service will assist in the second semester. First semester, Wed. and Fri. at 5 commencing Nov. 2d. Second semester, Wed. and Fri. at 5 commencing Feb. 1st. (2 cr.)

The first semester is devoted to a general treatment of atmospheric processes with special emphasis on methods of air mass analysis and their application to synoptic charts of the surface and upper-air and to forecasting. The course is intended to be of an introductory nature, but those without some familiarity with meteorology will be at a disadvantage.

In the second semester a course in climatology, based on the newer concepts of physical meteorology, will be developed. Problems of agriculture, hydrology, soil conservation, land forms, and human settlement in its relation to climatic or meteorologic conditions will be discussed.

DYNAMIC METEOROLOGY (IV,V) - Dr. Horace G. Byers and Mr. H. Wexler; Tues. and Thurs. from 5 to 6 commencing Jan. 31st. (2 cr.)

A one semester course covering the thermodynamics of the atmosphere, equation of motion and atmospheric flow, energy transformations, lateral and vertical turbulence, and special problems of the general circulation.

Prerequisites: Mathematics through ordinary differential equations; two years college physics; general knowledge of meteorology.

AERIAL PHOTOGRAPHY AND CARTOGRAPHY. To be arranged; consult the list of special announcements to be issued later.

GRAPHIC PRESENTATION

(Undergraduate)

These subjects have a three-fold purpose: first, training in graphic expression; second, developing draftsmen as designers and supervisors in the architectural and mechanical fields; third, training in the reading of blueprints and specifications. The cost per course will be $20 per semester except where otherwise stated. Prerequisite: 15 standard high school units or equivalent.

FREEHAND DRAWING AND SKETCHING (III,IV) - Mr. F. A. Updegraff; Mon. and Wed. from 5 to 7 commencing Jan. 30th. Fee $15. (2 cr.)
Shades and shadows, theory and harmony of color, composition; outdoor sketching in color the last half of the semester.
Sketching only, two hours a week without credit, on Mondays from 5 to 7; fee $10.

ARCHITECTURAL DRAWING (II,III) - Dr. G. L. Edick; Tues. and Thurs. from 7 to 9 p.m. commencing Feb. 7th. (2 cr.)
Elementary: geometrical problems, orthographic projections, lettering, architectural symbols. Advanced: residence design, working drawings, details of construction, studies of modern methods of framing and use of building materials.

MECHANICAL DRAWING (II,III) - Mr. G. L. Edick; Tues. and Thurs. from 7 to 9 p.m. commencing Feb. 7th. (2 cr.)
Elementary: geometrical problems, orthographic projections, intersections and developments, lettering, and study of material symbols. Advanced: studies in machine shop practice, assembly and detail drawings, scale detail drawings from measured sketches by the student.

BLUEPRINT READING (III,IV) - Mr. G. L. Edick; Tues. and Thurs. from 7 to 9 p.m. commencing Feb. 7th. (2 cr.)
The interpretation of standard symbols; dimensioning. Simple problems in orthographic projection requiring a small amount of drawing. The study of projection planes and sections. Some study of details of construction and plans.

LANGUAGES

The standard university language course is three semester hours, each class of fifty minutes. The courses now given for two semester credits meet twice weekly for sixty minute periods. The standard requirements (3 cr.) may therefore be met by an additional thirty minutes per week. Those desiring the three semester credits in courses marked "2-3 cr." must register for them in advance, paying $18 per semester instead of $12.

Courses marked I, II are undergraduate, those marked III, IV are advanced undergraduate or graduate.

CONVERSATIONAL SEMINARS IN FRENCH AND GERMAN (III) - Miss Mary Sabarth; Tues. and Thurs. at 4:50 commencing Jan. 31st. (2 cr.) Groups limited to fifteen.

These seminars are designed to give facility in conversation, use of idiom and correct pronunciation, development of vocabulary in social and business contacts. (Miss Sabarth has had many years of residence and teaching experience in foreign countries and in America, especially at Roberts College in Constantinople, schools in Berlin, and at Barnard College of Columbia.)

Prerequisite: A good reading knowledge of French and German.

* ELEMENTARY SCIENTIFIC FRENCH (I,II) Continuation of the first semester. - Dr. Harry B. Humphrey; Mon. and Wed. at 4:50 commencing Jan. 30th. (2-3 cr.)

Instruction in elements of French grammar. Reading and translation of elementary articles from selected scientific texts. This course is designed to prepare beginners for the advanced course in Scientific French.

* ADVANCED SCIENTIFIC FRENCH (III,IV) Continuation of the first semester. - Dr. Harry B. Humphrey; Tues. and Thurs. at 4:50 commencing Jan. 31st. (2-3 cr.)

* ELEMENTARY GERMAN (I) Continuation of the first semester. - Dr. C. H. Leineweber; Mon. from 5 to 7:30 commencing Jan. 30th. (2-3 cr.)

* ADVANCED AND TECHNICAL GERMAN (III) Continuation of the first semester. - Dr. C. H. Leineweber; Fri. from 5 to 7:30 commencing Feb. 3d. (2-3 cr.)

ELEMENTARY RUSSIAN (I) Continuation of the first semester. - Dr. C. H. Leineweber; Wed. from 5 to 7:30 commencing Feb. 1st. (2-3 cr.)

LECTURES ON RUSSIAN LITERATURE (III) - Dr. C. H. Leineweber; Thurs. from 5 to 6 commencing Feb. 2d. (1 cr.) Fee $6.

These lectures will cover the lives and works of the most important writers in Russian literature and will be delivered in English. No knowledge of Russian required.

* BEGINNING SPANISH (I) Continuation of the first semester. - Miss Ruberta M. Olds; Mon. from 5 to 7:30 commencing Jan. 30th. (2-3 cr.)

The aim of this course is to secure accuracy and facility in the use of the language by means of drill in pronunciation, conversation, grammar and reading. Texts - a good basic grammar, a reader called A México por Automóvil, and maps of Spanish-American countries.

* SPANISH CONVERSATION AND COMPOSITION (II,III) Continuation of the first semester. Miss Ruberta M. Olds; Wed. from 5 to 7:30 commencing Feb. 1st. (2-3 cr.)

The aim of this course will be to develop ability to understand and to converse in simple idiomatic Spanish, to translate articles in newspapers and magazines, and to compose and translate ordinary business and social letters, and to read for enjoyment.

Prerequisite: Beginning Spanish or its equivalent.

* ELEMENTARY ITALIAN (I,II) Continuation of the first semester. - Dr. Nicholas G. Barbella; Tues. from 5 to 7:30 commencing Jan. 31st. (2-3 cr.)

The fundamentals of the language, with practice in conversation. Texts: Joseph L. Russo, Elementary Italian Grammar; Marro, Contemporary Italian Short Stories.

LAW

(Graduate and advanced undergraduate)

* LABOR LAW AND LEGISLATION (IV,V) Continuation of the first semester. - Dr. David Ziskind; Tues. and Thurs. at 5 commencing Jan. 31st. (3 cr.)

Social legislation and the administrative problems of labor agencies. Legislation on hours, wages, and social security; and the techniques of drafting labor legislation. A study of the procedures followed before such agencies as the National Labor Relations Board,

the Social Security Board, the National Mediation Board, the Division of Public Contracts, the Fair Labor Standards Division, and the various State labor departments. This semester's work is complete in itself and may be taken alone or prior to the repetition of the first half of the course next year.

LABOR PROBLEMS AND PROGRAMS (IV,V) Continuation of the first semester. - Dr. David Ziskind; Mon. and Wed. at 5 commencing Jan. 30th. (3 cr.)

Unionism, scientific management, personnel management, industrial democracy, protective labor legislation and the administration of labor laws. Special attention will be given the fields in which students are employed or in which they are particularly interested. This material is complete in itself and may be taken alone or prior to the first half of the course, which will be offered next year.

PATENT LAW AND PROCEDURE (IV,V) - Mr. Paul D. Boone; Wed. and Fri. at 5 commencing Feb. 1st. (2 cr.)

Rules of practice in the U. S. Patent Office; preparation of applications; amendments; Patent Office action; Commissioner's decisions, such as taken up in Woolcott's manual; file histories of patents, etc.

* A SEMINAR COURSE ON THE CURRENT DECISIONS OF THE SUPREME COURT (IV,V) - Miss Charlotte A. Hankin; Fri. from 5 to 7 commencing Feb. 3d. (2 cr.) (Miss Hankin, A.B., LL.B., is Associate Editor, U. S. Supreme Court Letter and Progress of the Law in the Supreme Court.)

A study of the decisions of the Supreme Court as they are handed down currently, week by week. It will be prefaced by consideration of the jurisdiction of the Supreme Court in our judicial set up.

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COTTON CLASSING (III,IV) - Mr. J. T. Moriarity, in cooperation with the Cotton Division, Bureau of Agricultural Economics; a ten weeks course held in the Cotton Division Laboratory on the sixth floor of the Annex Building, 12th and C. Sts. S.W., from 4:30 to 5 daily and 1:30 to 3:30 on Saturdays, with permission to substitute the 8:30 to 9 a.m. period daily; commences April 3d. (2 cr.)

Limited to those having expert knowledge of cotton. A study of grade, color, staple, and preparation. Registration limited to fifteen.

COTTON MARKETING (I) - Mr. John W. Wright. To be offered next year.

EXTENSION SEMINARS (IV,V) Continuation of the first semester. - Messrs. M. C. Wilson and Barnard D. Joy; twice weekly, hour arranged to meet the convenience of class. Room 5534, South Building. Open to those with extension teaching experience, or with background of educational training satisfactory to instructor.

Extension Methods. Ways of measuring extension progress; the influence of such factors as size of farms, land tenure, educational training, age, and contact with extension workers upon effectiveness of extension teaching.

The various means and agencies employed in extension teaching such as result demonstrations, method demonstrations, meetings, news articles, personal service, bulletins, exhibits, circular letters, extension schools, and radio, will be carefully analyzed from the standpoint of their teaching function, adaptability to different subject matter, relative influence, relative cost, and interrelationship.

* THE SELF CONTAINED FARM (IV,V) - Dr. M. L. Wilson, Under Secretary of Agriculture.

For further information communicate with the Graduate School. This course is in process of organization by cooperative arrangement between the Graduate School of American University and the Graduate School of the Department of Agriculture.

FILING SEMINAR — Mr. John S. Lucas, chairman.

This is organized as a non-credit seminar without fee. It is open only to those in charge of files or classification of material to be filed. The class meets weekly. (Prospective students may consult Mr. Lucas at the Farm Security Adm., Br. 331 or 332.)

* NON-COMMODITY USE OF FORESTS (IV,V) - Mr. Robert Marshall, Chief, Division of Recreation and Lands, Forest Service.

For further information communicate with the Graduate School. This course is in process of organization by cooperative arrangement between the Graduate School of American University and the Graduate School of the Department of Agriculture.

GLASS BLOWING (A laboratory course for technicians) Continuation of the first semester. - Dr. Leland B. Clark; Mon. and Wed. at 4:50 commencing Jan. 30th, in the basement of the Smithsonian Institution. Fee $18 per semester, including materials. Registration limited to ten students.

RECENT HISTORY OF THE UNITED STATES (III,IV) - Dr. W. M. Gewehr; Fri. from 5 to 7:30 commencing Feb. 3d. (2-3 cr.)

The aim of this course is to study the history of the United States since about 1890 with a view to affording a historical approach to our problems of today.

DESCRIPTIVE MINERALOGY (II) Continuation of the first semester. - Miss Jewell G. Glass; Mon. and Wed. at 4:50 commencing Jan. 30th. (2-3 cr.)

Lectures: A study by inspection of the individual rock-forming minerals, in hand specimens, both in crystal form and in rock masses. Descriptive physical properties, including a brief review of crystallography, general physical and chemical characters of each species, and an account of the mode of occurrence and characteristic associations of each mineral. Uses and economic importance. A study of the external forms, structure, texture, hardness, gravity, cleavage, color, etc. A study of the internal or molecular structure. Special lectures on atomic structure of crystals illustrated with models. Illustration of the study of minerals by X-ray.

Laboratory: Identification of "unknowns" - 100 mineral specimens; (a) by qualitative chemical tests; (b) by blowpipe analysis.

BASIC PHOTOGRAPHY (III,IV) - Mr. Carl H. Hanson and other specialists. To be offered next year.

RADIO ENGINEERING (IV,V) - Dr. Lynde P. Wheeler, Thurs. from 5 to 7 commencing Feb. 1st. (2 cr.)

The theory of the vacuum tube and its use as amplifier, oscillator, and detector, and a discussion of other problems relating to transmission and reception of radio signals. Emphasis will be placed on the mathematical processes useful for the solution of radio problems.

SOIL CONSERVATION (II) - Dr. Jay A. Bonsteel with the cooperation of a committee from the Soil Conservation Service; to be offered next fall.

SOILS: THEIR MORPHOLOGY, GENESIS, AND CLASSIFICATION (V) - Dr. Charles E. Kellogg; Mon., Wed., and Fri. at 4:50 commencing Jan. 30th. (3 cr.)

Soil development with examples from the United States. Students should have had college freshman chemistry; previous training in plant physiology; geology, geography, and logic would be helpful, but not essential.

In the development of the course the subject matter will be treated in the following order; brief history of the development of soil science; the nature of soils; the factors of soil genesis; determination of soil morphology and the classification of types; the processes of soil development. The great soil groups will be discussed in connection with the treatment of the soil processes under which they are formed: calcification, podzolization, laterization, salinization, solidization, solonization, gleization.

MATHEMATICAL PREPARATION FOR STATISTICS

(Courses marked I and II are undergraduate; III and IV, advanced undergraduate; V, graduate)

The instructor or Dr. Deming should be consulted by any persons who are in doubt about their preparation and fulfillment of prerequisites.

* 1 ALGEBRA (I) - Mr. Harry J. Winslow; fall semester only.

* 2 TRIGONOMETRY AND GEOMETRY (I) - Mr. Harry J. Winslow; Tues. and Thurs. at 5 commencing Jan. 31st. (2 cr.)

Definitions in trigonometry; identities; complex numbers; DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves. Polar coordinates. Families of curves; one or more parameters Parametric equations of curves. Radical axis; graphic solution of equations. Some three-dimensional geometry.

Prerequisite: Mathematics 1 or its equivalent.

* 3, 4 CALCULUS (II) - Dr. W. Edwards Deming. Offered in alternate years; due next year.

* 5 HIGHER ALGEBRA (III) - Dr. E. J. Finan of Catholic University; fall semester next year and alternate years.

* 7 THE CALCULUS OF FINITE DIFFERENCES (II,V) - Dr. W. Edwards Deming; fall semester 1941-42 and every fourth year.

9 MATHEMATICS OF INVESTMENT (IV,V) - Messrs. Eugene A. Rasor and Dorrance C. Bronson, F.A.S.; Oct. to April; to be offered again in 1940-41.

* 11, 12 ADVANCED CALCULUS (IV,V) Continuation of the first semester. - Mr. Albert Wertheimer; Wed. and Fri. at 5 commencing Feb. 1st. To be offered every two years.

Review of the fundamental theory of the calculus. Taylor's series and related subjects. Plane curves, envelopes, order of contact. Differentiation and integration of integrals. Line, surface, and volume integrals. Infinite and improper integrals. Some calculus of variations. Asymptotic series and approximations to definite integrals. Functions with several variables. Function scales and relations between derivatives. Reduction of curves to linear relations. Surfaces, tangent planes, and normals. Some study in the complex variable. Text: E. B. Wilson, Advanced Calculus.

Prerequisite: Mathematics 3 and 4.

13, 14 LINEAR ALGEBRA (V) - Mr. M. A. Girshick. Given every third year; due in 1940-41.

15, 16 THEORY OF INFINITE PROCESSES (V) - Dr. C. Winston; to be offered next year.

17, 18 THEORY OF FUNCTIONS (V) - Mr. M. A. Girshick; to be offered next year.

19 INTERPOLATION, APPROXIMATION, and MECHANICAL QUADRATURE (V) - Professor J. Shohat of the University of Pennsylvania; six lectures on alternate Monday evenings at 8:15 in room 1039, commencing January 30th. The first meeting will be devoted to a survey of basic material and reading assignments. No registrations will be accepted after the first meeting. Fee $6. (1 cr.)

Approximation of continuous functions by polynomials and trigonometrical sums; Weierstrass' theorems; Tchebycheff's "best" approximation. Degree of approximation (Bernstein, Poussin, Jackson). Lagrange. Remainder, convergence and divergence of interpolation formulas. Trigonometric interpolation. Parabolic interpolation. Mechanical quadrature (approximate evaluation of definite integrals); degree of approximation; convergence. Use of trigonometric and Legendre polynomials in quadrature.

Prerequisites: Calculus and elementary interpolation; function theory or advanced calculus advised.

STATISTICS

LECTURES BY W. G. COCHRAN OF ROTHAMSTED. Mr. Cochran will be here for two lectures the first week in January. Detailed announcements of the time and place can be secured from the Graduate School.

The Graduate School plans to bring annually to Washington one or two leaders in statistical thought. In the past R. A. Fisher, J. Neyman, John Wishart, Frank Yates, and Walter A. Shewhart have given courses of lectures here with informal seminars, some of which are available in print (see the list of publications on page iv).

Prefatory Note

Most if not all problems of inference from data in agriculture are not and can not be made purely statistical, but must involve close attention to the scientific aspects. There is no such thing as being trained in statistics without being trained also in some branch of science and in philosophy. In conjunction with the courses in statistics, the student is earnestly urged to pursue studies in these lines of thought; such work constitutes an intangible prerequisite to progress in statistical inference. Moreover, any course, statistical or otherwise, necessarily receives its character from the instructor, wherefore students planning to undertake work in statistics are advised to look forward to a well-rounded program, not to be curtailed until a number of points of view have been acquired. Mathematics in various degrees, both as a tool and as a mode of thought, is indispensable to studies in statistics, and it is a rule that students working for credit in any course must come prepared with the stated mathematical prerequisites. Dr. Deming will be in the office of the Graduate School, room 4090 South Building, after 3 o'clock on Monday, Wednesday, and Friday of the weeks commencing Jan. 16th and 23d for consultation regarding preparation and the selection of courses.

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SEMINARS IN STATISTICS - 1st and 3d Mondays of each month at 8:15 p.m. Membership limited to people who can contribute a survey of original work or of journal articles. This is not a credit course. Fee 50 cents per semester. Applications should be sent in writing to the Director.

GRAPHIC METHODS APPLIED TO RESEARCH ANALYSIS (I) Continuation of the first semester. Mr. R. G. Hainsworth; Tues. and Thurs. from 5 to 7 commencing Jan. 31st. Fee $15.00 (2 cr.)

First semester to be given fall of 1939-40. Charts and diagrams; general discussion of the major groups and the breakdown into their various classes, forms and types. General chart interpretation. Actual working examples of time series, frequency and other forms of illustrations. Applications of the pictorial aspect to charting. Prevailing and suggestive examples of chart standardization and preparation of data for graphic presentation.

Second semester. Maps: How to interpret them; when and how to use them; their preparation and adaptability; examples of data as applied to statistical and geographical maps. Actual working examples of multiple dot, circle, pie diagram, cross hatch, line, basic outline and topographic and physiographic types will be given.

1 INTRODUCTION TO STATISTICAL ANALYSIS (II). - Messrs. Sidney Wilcox, B. R. Stauber, and Solomon Kullbach; Tues. and Thurs. at 5 commencing Jan. 31st. (2 cr.)

This course is designed to give the student a thorough understanding of the methods and problems of collecting statistical data, the presentation of such data in the form of tables and graphs, and the use of the different types of averages, the measures and significance of dispersion, elementary principles of sampling, and introduction to the construction and significance of index numbers, and the analysis of time series.

Prerequisite: Mathematics 1 or equivalent.

2 INTRODUCTION TO STATISTICAL ANALYSIS (II) - Messrs. Sidney Wilcox, B. R. Stauber, and Solomon Kullbach; Mon. and Wed. at 5 commencing Jan. 30th, also Tues. and Thurs. at 5 commencing Jan. 31st. (2 cr.)

This will be a continuation of the preceding course. The analysis of relations between two or more variables. The measurement of association and of the different phases of correlation, beginning with simple correlation of data applying to a given period of time and advancing to multiple linear correlation, and an introduction to the concept of the analysis of variance and its relation to correlation.

Prerequisite: Statistics 1 or equivalent.

4 STATISTICS LABORATORY (II) - Dr. Beatrice Aitchison; once weekly on Thursdays at 7, commencing Feb. 2d. (1 semester credit for students taking course 2 or who have had its equivalent.)

A laboratory section, meeting once a week for two hours for instruction and practice in the application of machine methods to the statistical processes presented in course 2. Students not registered in course 2 will be given other assignments.

* 5 INDEX NUMBERS AND TIME SERIES ANALYSIS (III) - Mr. C. M. Purves; fall semester only.

* 6 CORRELATION ANALYSIS (III) - Mr. C. M. Purves; Tues. and Thurs. at 5 commencing Jan. 31st, (2 cr.)

The application of advanced correlation methods to practical problems, particularly those involving time series. Various methods including mathematical and freehand multiple curvilinear correlations, use of logarithms and first differences and joint correlation will be applied to a specific problem chosen for analysis. Emphasis is placed upon the limitations of correlation in analyzing problems including time series and the significance of results obtained. The course also includes a brief review of the analysis of variance and its relationship to correlation.

Prerequisites: Statistics 1, 2, 5.

* 7, 8 THE INTERPRETATION OF STATISTICAL CALCULATIONS (III) - Mr. Alexander Sturges; Mon. and Wed. at 5 commencing Feb. 1st. (2 cr.)

The second semester will deal with the selection and use of statistical tests to reach satisfactory practical judgments, when possible, in a wide variety of problems. Emphasis will be placed on the choice of method so that the student may learn to seek the simplest and most effective of several alternatives. The illustrative problems will include those dealing with single as well as multiple attributes and variables under simple sampling conditions; also with time series and allied situations in which conditions of sampling are not adequately met.

Prerequisites: Statistics 1 and 2 and Mathematics 1 and 2.

9, 10 STATISTICS FOR BIOLOGICAL WORKERS (III) - Professor W. B. Kemp of the University of Maryland. To be offered next year.

11 STATISTICAL TREATMENT OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (II) - Dr. A. E. Brandt; commencing Nov. 22d and ending in March. (2-3 cr.)

Prerequisite: High school algebra. Opportunities will be provided in the use of more mathematics for those who are qualified.

13, 14 ADJUSTMENT OF OBSERVATIONS (V) - Dr. W. Edwards Deming. Offered in 1940-41.

* LEAST SQUARES (IV,V) - Dr. W. Edwards Deming; Mon. and Wed. at 4:45 commencing Feb. 1st; 2d semester only, this and every fourth year. (2 cr.)

Some theory of errors and review of statistical distributions. History of least squares. The chi-test; estimates of precision. Least squares as the minimizing of chi-square. Problems in curve fitting and geodesy. Weights. Propagation of errors. The general problem. Systematic computation. Applications to triangulation, physics, and agricultural experiments. Texts: Deming and Birge, Statistical Theory of Errors; Deming, Least Squares.

Prerequisites: Statistics 1 and 2; Mathematics 3 and 4.

* 17, 18 MULTIVARIATE ANALYSIS (V) - Mr. M. A. Girshick; Tues. and Thurs. at 4:45; second semester commencing Jan. 31st, this and every third year. (2 cr.)

Function theory is reviewed as necessary. Some theorems on probability; theorems on mean value; moment generating functions; the characteristic function. Multivariate normal distribution; joint moments of sample variances and covariances. Sampling from a bivariate normal population. Tests of significance; problems of estimation. Joint distribution of variance and covariance; distribution of correlation coefficient when the population correlation is and is not zero. Least squares; classical application; relation to maximum likelihood. Distributions of the multiple correlation coefficient. Orthogonal polynomials. Derivations of some of the Wilks, Pearson, and Neyman distributions. Factor analysis. Canonical correlation. Non-normal distributions. Applications.

Prerequisites: A course in advanced statistics; Mathemetics 3, 4, 13, 14.

* ANALYTIC CURVE FITTING (IV,V) - Dr. Max Sasuly; fall semester only, every third year.

* 20 DYNAMIC ANALYSIS OF TIME SERIES (IV,V) - Dr. Max Sasuly; Mon. and Wed. at 5 commencing Jan. 30th; 2d sem. only, this and every third year. (2 cr.)

Fitting by differential equation relations for interacting series; generalized multiple correlation. Integral equation relations for special economic series.

Prerequisites: Statistics 1, 2, 4; Mathematics 1, 2, 3, 4.

21, 22 THEORY AND APPLICATION OF THE CHARACTERISTIC FUNCTION (V) - Dr. Solomon Kullbach. To be offered in 1940-41.

23, 24 SPECIAL TOPICS IN STATISTICS (III) - Fridays at 5; to be offered next year.

This will be a series of from one to three lectures by each of a number of experts in various fields of application, mainly in sampling procedure.

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See also courses in Mathematics and Economics

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SPEED REPORTING

REPORTING (70 to 110 words per minute) - Alice Coffman; Tues. and Thurs. at 5 commencing Feb. 7th.

This course is designed for those who desire a review of theory in Gregg Shorthand with dictation from 70 to 110 words per minute. Special attention will be given to the acquisition of a large vocabulary of Gregg outlines. Dictation will be graded from business letters and the Congressional Record; legal and technical matter relevant to the work in government offices.

Class will be limited to 25 members.

REPORTING (100 to 150 words per minute) - Miss Clara E. Richter; Mon. and Wed. at 5 commencing Feb. 6th.

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand that they write prior to entering the class. A non-technical entrance examination will be held Saturday, January 28th, in room 1039 South Building at 2 p.m. at the rate of 100 words per minute. Transcription must be in ink. It is required that each student have an admission card to the examination room, which can be obtained from the Graduate School, 4090 South Building. All admission cards must be secured prior to the date of examination.

REPORTING (175 words per minute and up) - Miss Clara E. Richter; Tues. and Thurs. at 5 commencing Feb. 7th. (No entrance examination is required.)

REPORTING IN SPANISH - Mr. C. Herbert Cook; Mon. and Wed. at 4 commencing Feb. 6th.

For beginners and advanced students who are interested in taking up shorthand in Spanish.

PHILOSOPHY, PSYCHOLOGY, SOCIOLOGY

(Courses marked II are undergraduate; IV, V, advanced undergraduate; V, graduate)

HISTORY OF PHILOSOPHY (IV,V) Continuation of the first semester. - Dr. George S. Painter; Tues. and Thurs. from 4:50 to 6:15 commencing Jan. 31st. (3 cr.)

Modern philosophy. The history of modern philosophy begins with the Renaissance and comes down to the present time.

GENERAL PSYCHOLOGY (II) Continuation of the first semester. - Dr. Paul Kaufman; Mon. and Wed. from 5:15 to 6:30 commencing Jan. 30th. (3 cr.)

A general survey of the nature of human personality. The leading current schools of psychological thought. The nervous system and sense organs. Elements of behavior at various levels. Among the processes examined are perceiving, imagining, learning, remembering, feeling, and thinking, with special attention to motivation in the emotions. Habit, intelligence, aptitudes, the subconscious, complexes, the resolution of conflicts, and the relation between mind and body. Emphasis is placed on the consciousness and behavior of adults; the psychology of the infant is summarized in relation to the problems of instinct and reflexes and to the factors of heredity and environment.

This course is intended to be of practical value in developing a deeper knowledge of the individual self and in stimulating more effective adjustment to one's surroundings.

SOCIAL PSYCHOLOGY (II) - Dr. Paul Kaufman; Tues. and Thurs. from 7:30 to 8:45 p.m. commencing Jan. 31st. (3 cr.)

The program of this course is arranged in two divisions: the psychology of group behavior and the social development of the individual. In the first are studied the collective mind of crowds, mass movements, public opinion, propaganda; and the patterns of social attitudes in the various fields of human thought and activity. In the second, after a brief review of the nature of inherited capacities and of social life, are surveyed the influences of group experience in shaping individual personality. The character and extent of these influences are traced in the adoption of language, habits, conventions, tastes, ideas of right, privileges, and obligations. The methods of adoption, conscious and unconscious, are also examined in a consideration of the various kinds of contact and of the reactions of different types of individuals to social pressures.

Some previous understanding of elementary psychology is a desirable but not essential foundation for this course.

* PRINCIPLES OF RURAL AND URBAN SOCIOLOGY (V) - Drs. Carl C. Taylor and C. P. Loomis. To be offered in 1939-40.

* RURAL SOCIAL PSYCHOLOGY (V) - Drs. Carl C. Taylor and C. P. Loomis; Mon. and Wed. at 5 commencing Jan. 30th. (2 cr.)

This course deals with the psychology and social psychology of rural groups — communities, institutions, farmers' organizations, and rural classes; with the customs, traditions, and folkways of rural peoples; and with the interactions between rural and urban cultures. It gives special consideration to what may be called the folklore of rural society, and the influence of farm practices and relative isolation on the attitudes, opinions, and philosophies of farm people. Specific topics such as suggestion, imitation, public opinion, farmer pressure groups, and farmers' movements will be discussed.

Prerequisites: Either one course in social psychology, or one course in sociology and one course in psychology.

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See also the general lectures over the page

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GENERAL LECTURES

PROBLEMS IN PERSONALITY ADJUSTMENT - A course of ten lectures by nationally known authorities, Fridays at 5, January 6 - March 10, 1939. Dr. Paul Kaufman, Chairman. Fee $4.

Among the lecturers who will participate are Professor H. A. Overstreet of the College of the City of New York, Professor Hornell Hart of Duke University, Professor Goodwin Watson of Columbia University, Professor Esther Richards of the Johns Hopkins Medical School, and Dr. Winifred Richmond of St. Elizabeth's Hospital.

Subjects of the lectures -

1. What is the effectively adjusted personality?
2. Making the best of our nerves
3. Getting along with our emotions
4. Finding freedom from worry and fear
5. Educating ourselves in the problems of sex
6. Adjustments in marriage and in family relations
7. Adjustment through psychoanalysis
8. Adjusting ourselves to the daily work
9. Adjustment and social attitudes
10. Adjusting the whole personality

CURRENT SOCIAL PROBLEMS - A course of ten lectures by nationally known authorities, Fridays at 5, March 17 - May 19, 1939. Dr. Paul Kaufman, Chairman. Fee $4.

HISTORY AND PHILOSOPHY OF SCIENCE - A course of fifteen lectures by nationally known authorities, Thursdays at 4. Dr. M. L. Wilson, Under Secretary, Chairman. Fee $3.

Special announcements giving names of speakers and other information will be available upon request after December 15th.

Other lectures will be announced later

Persons who are ready to register for any of the courses listed are urged to fill out the following

REGISTRATION FORM

which provides the most convenient means of registration. It should be mailed previous to January 23d, for the reason that room and section assignments are to be made on the basis of registrations made up through that date; late-comers often necessitate readjustments and create extra overhead, as well as inconvenience to those who have already registered and received their room assignments.

To: Dr. A. F. Woods
Director of The Graduate School, Room 4090
U. S. Department of Agriculture
Washington

(Chain envelopes should be used in the Department of Agriculture.)

I should like to register for the following courses:

_____

_____

My educational background is shown below:

_____
(Here show high schools and universities attended, degrees, and dates)

_____

_____

_____

A cheque / money order for $_____ is enclosed. (Tuition is $6 per semester credit, the fee for a 2 hour course is accordingly $12, for a 3 hour course $18, except when noted.)

Yours truly,

_____
Name (Please write or print plainly)

Residence _____ Telephone _____

Present position _____ Telephone _____

Where employed _____

(A registration card, constituting a receipt, will be mailed to you before classes commence.)

- F - L - I - E -

GRADUATE SCHOOL
DEPARTMENT OF AGRICULTURE

Special Announcement

FAMOUS WOMEN OF HISTORY - Mlle. Mary Sabarth; Wed. from 5 to 6 commencing March 1st. Fee $6.

Twelve lectures: 16th century - Catherine de Medici and her daughter, Marguerite de Valois. Mary Stuart, Queen of Scotland. 17th century - Influential Women in the Court of Louis XIV. 18th century - La Marquise de Pompadour. Marie Antoinette and her son, Louis XVII. 18th and 19th century - Laetitia, Napoleon's mother. Josephine, Napoleon's first wife. Peggy O'Neil, the American Pompadour. Florence Nightingale. Empress Eugenie, wife of Napoleon III. The wife of Sultan Mahmud II.

PRINCIPLES OF ADMINISTRATIVE MANAGEMENT (II, III) - Dr. Eldon Lee Johnson, Asst. Chief, Organization and Planning Section, Office of Personnel, Dept. of Agriculture; Mon. and Wed. from 5 to 6 commencing March 6th. (2 cr.)

This course is designed to introduce the student to the elements of organization, personnel and fiscal management, planning, public relations, and controls of administration. Attention will be devoted to the evolution of administrative organization; organizational types; staff, line, and auxiliary agencies and functions; problems of coordination and devolution; the broadest aspects of personnel selection, classification, training, movement; and relations; budgeting and fiscal control; auditing and financial accountability; planning management; the relation of layman, expert, and administrator; executive responsibility and types of administrative controls, their importance and special problems.

These principles and problems will be illustrated by reference to recent or current developments in industrial, municipal, state, and national administration.

HOME GARDENING AND LANDSCAPING - W. R. Beattie; Mon. from 8 to 9 p.m. commencing Feb. 20th. Ten illustrated lectures. Fee $5.

Topics: Development of premises. Soil and management. Lawns. Ornamental plantings. Flower gardens. Vegetable gardens. Home fruit gardens. Propagation of plants.

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Ten lectures on
SCIENCE: Its History, Philosophy, and Relation to Democracy
M. L. Wilson, Under Secretary of Agriculture, in Charge
Wednesdays at 5 in the auditorium

First lecture on March 8th by Dr. F. R. Moulton (Permanent Secretary of the A.A.A.S.). Second lecture on March 15th by Dr. John C. Merriam (The Carnegie Institute of Washington). Fourth lecture, March 29th by Dr. E. G. Conklin (Princeton). Other leading scientists and philosophers are being invited.

Fee $2.50. Mail cheques to The Graduate School to secure seats.

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GRADUATE SCHOOL
DEPARTMENT OF AGRICULTURE

S O C I A L P R O B L E M S O F T O D A Y

A course of ten lectures

by nationally known authorities

Fridays at 5 p.m., commencing March 31st

Fee $3

SUBJECTS OF THE LECTURES

1.	What are the peculiar social problems today?	March 31
2.	How can we best distribute the national income?	April 7
3.	Adjusting ourselves to the machine	April 14
4.	The population problem today and tomorrow	April 21
5.	Changing standards in family relations	April 28
6.	Physical and mental health for all	May 5
7.	The crime menace: sources and prevention	May 12
8.	Shaping social attitudes: press, radio, and movies	May 19
9.	Education for an age of change	May 26
10.	National social problems in a world community	June 2

AMONG THE LECTURERS WHO WILL PARTICIPATE ARE

Dr. Howard Odum, Director of the Institute for Social Research, University of North Carolina

Professor Raymond Pearl, Johns Hopkins University

David Cushman Coyle, author of "Brass Tacks" and "Uncommon Sense"

Professor Frank H. Hankins, Smith College, President of the American Sociological Society

Professor Hornell Hart, Professor of Sociology, Duke University

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AGRICULTURAL ECONOMICS
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THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE
Washington

Ten lectures on -
SCIENCE: Its History, Philosophy, and Relation to Democracy
M. L. Wilson, Under Secretary of Agriculture, in charge
Wednesdays at 5 o'clock
in the Auditorium

General theme: Science, theoretically and technically, has far outstripped the study of social relations, and although it is admitted that science has contributed vastly to the welfare of humanity, not every scientific advance has been also a social advance. Such a situation calls for an acute analysis. We must look at the history and development of science to try to learn what constitutes a scientific statement and what constitutes scientific progress. The aim of the Under Secretary of Agriculture, in promoting this series of lectures, is to arouse interest in the meaning and aims of research and its relation to democracy and social needs.

March 8th — What are the most fundamental types of thinking among present day British and American scientists?
- F. R. Moulton (Washington, Permanent Secretary of the A.A.A.S.)

March 15th — The cultural and social values of science in relation to progressive civilization.
- John C. Merriam (President emeritus of the Carnegie Institution of Washington)

March 22d — Reason and nature - The philosophy of science and scientific methods.
- Morris R. Cohen (Lecturer in Philosophy, Harvard and Chicago)

March 29th — Science and ethics.
- E. G. Conklin (Emeritus professor of Zoology, Princeton; former president of the A.A.A.S., and of the American Philosophical Society)

April 4th — The history of science and its place in contemporary civilization.
-*Henry E. Sigerist (Professor of the History of Medicine, Johns Hopkins)

April 12th — What is science?
-*C. I. Lewis (Professor of Philosophy, Harvard)

April 19th — The place of science in democracy.
- A. Einstein* (Institute for Advanced Study, Princeton)

April 26th — Society and organism.
- Walter B. Cannon (President of the A.A.A.S.; Professor of Physiology, Harvard)

May 3d — To what extent is a science of man possible?
- Frederick Osborn* (Museum of Natural History, New York)

May 10th — How can science get support in a democracy?

(Slight rearrangements of titles and dates may be found necessary)

Fee for the course, $2.50. Mail cheques to the Graduate School to secure tickets in advance and thus avoid delay at the door.

*Arrangements not definite.

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THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE
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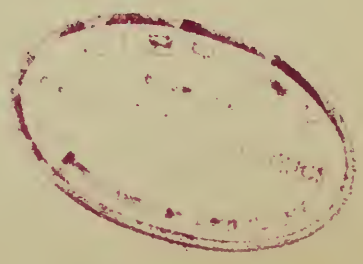

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F L I E R

GRADUATE SCHOOL
DEPARTMENT OF AGRICULTURE

SECOND SEMESTER COMMENCES JANUARY 30TH
REGISTER NOW

PRINCIPLES OF ACCOUNTING - FIRST AND SECOND YEAR COURSES

STATISTICS COURSES - ELEMENTARY AND ADVANCED COURSES

PUBLIC SPEAKING - BEGINNING AND ADVANCED COURSES

ENGLISH - COURSES IN GRAMMAR, CORRESPONDENCE, EDITING AND LITERATURE

ECONOMICS - ELEMENTARY AND ADVANCED COURSES

LANGUAGES - ELEMENTARY AND ADVANCED COURSES IN FRENCH, GERMAN, ITALIAN, RUSSIAN, SPANISH, as well as CONVERSATIONAL SEMINARS

GRAPHIC PRESENTATION - ECONOMIC DATA, ARCHITECTURAL, MECHANICAL and FREEHAND DRAWING, SKETCHING and BLUEPRINT READING

PSYCHOLOGY, SOCIOLOGY, PHILOSOPHY, LAW

MATHEMATICS - ELEMENTARY AND ADVANCED COURSES, including GEOMETRY, TRIGONOMETRY, INTERPOLATION, etc.

CHEMISTRY - ELEMENTARY AND ADVANCED COURSES

REPORTING - 70 to 110 WORDS; 100 to 150 WORDS; 130 to 170 WORDS; and 175 WORDS A MINUTE AND UP

The formal outline of courses is organized on a college basis, and a certificate showing the work accomplished is issued to each student upon request. These certificates are accepted by the Civil Service Commission, and by graduate schools and accredited colleges wherever the work fits into the program of studies approved by such schools.

The bulletin giving detailed descriptions of the courses for the second semester is now ready and may be obtained by filling in the blank below, which will be used as a mailing label.

Send it to THE GRADUATE SCHOOL
The Department of Agriculture
Washington

using a chain envelope if you are in the Department of Agriculture.

.....

(Give name and mailing address)

[1939]

THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE

announces a lecture by

Sir John Boyd Orr, M.D., D.Sc., LL.D., F.R.S.,
Director of the Rowett Research Institute, Aberdeen;
Director of the Imperial Bureau of Animal Nutrition

who will deliver an address on

"The Nutritional Problems of the British Empire"

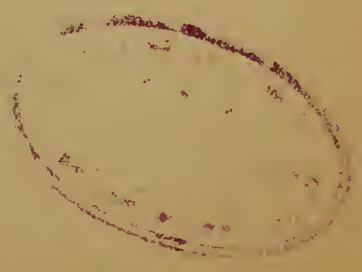
Friday April 21st
at
4:45 p.m.

in the Auditorium
of the
Natural History Building
of the
National Museum
10th St. and Constitution Ave.
Washington

Nutrition in its relation to health and national policy is a live subject in the British Empire. Sir John, as the result of his investigations of the nutrition of men and animals and of the nutritional status of people, and for his membership on the Committee on Nutrition (Ministry of Health) and the Colonial Advisory Council on Agriculture and Animal Health, has an unusual background for the discussion of the scientific and economic problems of the nutrition of men and animals.

The Canadian Medical Association's Committee on Nutrition is bringing Sir John to Canada to give a series of lectures in various cities on food and health and national food policies.

This is an open lecture. Anyone who is interested is invited to attend.



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THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE
in cooperation with
AMERICAN UNIVERSITY

A NEW APPRAISAL OF DEMOCRACY

The British-American committee of the Hall of Nations program of the American University, in cooperation with the Graduate School of the Department of Agriculture, presents

Dr. George Edward Gordon Catlin

in a series of three lectures

March 13th	The critics of democracy
March 20th	The tradition of democracy
March 23d	The future of democracy

In the Auditorium of the Department of Agriculture at 8 p. m.

Student tickets $1 at the office of the Graduate School, or at American University, 1901 F Street

F - L - I - E - R

THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE

STENOTYPY: Speed and accuracy building - Cecilia Woods Arnold Draper, Certified stenotype teacher. Dictation (60 to 250 words per minute, and over). Monday, Tuesday, Wednesday, and Thursday evenings from 5 to 10 p.m., commencing April 3d. Fee $12 for 72 hours.

This course is designed to enable operators to review theory and develop speed on basic vocabulary from 60 to 250 words per minute, and over. It will cover the entire Speed Manual Work, together with extra correlated dictation recommended, plus that selected and graded dictation designed to develop speed and skill in governmental requirements. Business letters, Congressional Record, legal, statistical, scientific, and technical matter relevant to the work in the various government offices will be used for extra dictation. Conference and reporting routine will be handled for advanced operators. Speed tests of different standards will be given at stated intervals.

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GRADUATE SCHOOL
DEPARTMENT OF AGRICULTURE

S O C I A L P R O B L E M S O F T O D A Y

A course of ten lectures

by nationally known authorities

Fridays at 5 p.m., commencing March 31st

Fee $3

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1.	What are the peculiar social problems today?	March 31
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Professor Raymond Pearl, Johns Hopkins University

David Cushman Coyle, author of "Brass Tacks" and "Uncommon Sense"

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- F - L - I - E - R -

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DEPARTMENT OF AGRICULTURE

Special Announcement

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PRINCIPLES OF ADMINISTRATIVE MANAGEMENT (II, III) - Dr. Eldon Lee Johnson, Asst. Chief, Organization and Planning Section, Office of Personnel, Dept. of Agriculture; Mon. and Wed. from 5 to 6 commencing March 6th. (2 cr.)

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Fee $2.50. Mail cheques to The Graduate School to secure seats.

Social Problems of Today

A COURSE OF TEN LECTURES

Presented by

THE GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE

WASHINGTON

FRIDAYS AT 5 P. M.

IN THE AUDITORIUM, SOUTH BUILDING

Beginning March 31, 1939

23

Social Problems of Today

THIS course is a presentation by authorities of the most critical social issues in which we seek the guidance of trained intelligence.

A limited number of enrollments from other departments and agencies of the government and from the general public will be accepted.

Register in room 4090 South Building from 8:30 a. m. to 5:00 p. m.; Saturdays to 2:00 p. m. Reservations may be made by telephone or mail. Call Republic 4142, extension 317. Enrollment fee, $3.00.

The Subjects and the Speakers

Facing Our Social Problems —*March 31*

DR. HOWARD W. ODUM, *Director, Institute for Research in Social Science, University of North Carolina*

How Can We Best Distribute the National Income? —*April 7*

DAVID CUSHMAN COYLE, C.E., *Consulting Engineer, New York City; Consultant to the Senate Committee on Unemployment and Relief; author of "Brass Tacks," "Roads to a New America," etc.*

Adjusting Ourselves to the Machine —*April 14*

DR. DEXTER S. KIMBALL, *Dean of the College of Engineering, Cornell University (1920-1936); former President, American Engineering Council*

Population Problems Today and Tomorrow —*April 21*

DR. RAYMOND PEARL, *Professor of Biology, sometime Director, Institute for Biological Research, Johns Hopkins University*

Changing Standards in Marriage —*April 28*

DR. FRANK H. HANKINS, *Professor of Sociology, Smith College; sometime Editor, "American Sociological Review"*

Physical and Mental Health: Needs and Opportunities —*May 5*

DR. MICHAEL M. DAVIS, *Chairman, Committee on Research in Medical Economics, New York; sometime Director, Medical Services, Julius Rosenwald Fund, Chicago*

The Crime Menace: Sources and Solutions —*May 12*

DR. HARRY ELMER BARNES, *Lecturer on Contemporary Civilization, The New School for Social Research; author of "Battling the Crime Wave," and "Progress of American Penology"*

The Shaping of Social Attitudes and Beliefs: Press and Radio —*May 19*

DR. HADLEY CANTRIL, *President, Institute for Propaganda Analysis; Associate Editor, "The Public Opinion Quarterly"; Associate Professor of Psychology, Princeton University*

What Kind of Education for an Age of Change? —*May 26*

DR. KARL W. BIGELOW, *Director, Commission on Teacher Education, American Council on Education; formerly Professor of Education, Teachers College, Columbia University*

National Social Problems in a World Community —*June 2*

DR. HORNELL HART, *Professor of Sociology, Duke University*

Dr. Paul Kaufman, Chairman of Lecture Series in the Social Sciences, will preside.

Our Individual Problems

cannot be separated from the social conditions in which we live. Today, our social problems are so acute and perplexing that we need all possible light from scientific inquiry.

This course presents an analysis of the main questions with which everyone must be concerned. Because of the importance of these issues discussed by a group of nationally known authorities, this series of lectures affords an opportunity of unusual appeal.

A. F. Woods,
Director.

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THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE

Ten lectures
Fridays at 5 o'clock
in the Auditorium
on

SOCIAL PROBLEMS OF TODAY

FACING OUR SOCIAL PROBLEMS - March 31
Dr. Howard W. Odum, Director, Institute for Research in Social Science, University of North Carolina.

HOW CAN WE BEST DISTRIBUTE THE NATIONAL INCOME? - April 7
David Cushman Coyle, C.E., Consulting Engineer, New York City; Consultant to the Senate Committee on Unemployment and Relief; author of "Brass Tacks", "Roads to a New America," etc.

ADJUSTING OURSELVES TO THE MACHINE - April 14
Dr. Dexter S. Kimball, Dean of the College of Engineering, Cornell University (1920-1936); former President, American Engineering Council.

POPULATION PROBLEMS TODAY AND TOMORROW - April 21
Dr. Raymond Pearl, Professor of Biology, sometime Director, Institute for Biological Research, Johns Hopkins University.

CHANGING STANDARDS IN MARRIAGE - April 28
Dr. Frank H. Hankins, Professor of Sociology, Smith College; sometime Editor, "American Sociological Review".

PHYSICAL AND MENTAL HEALTH: NEEDS AND OPPORTUNITIES - May 5
Dr. Michael M. Davis, Chairman, Committee on Research in Medical Economics, New York; sometime Director, Medical Services, Julius Rosenwald Fund, Chicago.

(over)

THE CRIME MENACE: SOURCES AND SOLUTIONS - May 12
Dr. Harry Elmer Barnes, Lecturer on Contemporary Civilization; The New School for Social Research; author of "Battling the Crime Wave," and "Progress of American Penology."

THE SHAPING OF SOCIAL ATTITUDES AND BELIEFS: PRESS AND RADIO - May 12
Dr. Hadley Cantril, President, Institute for Propaganda Analysis; Associate Editor, "The Public Opinion Quarterly"; Associate Professor of Psychology, Princeton University.

WHAT KIND OF EDUCATION FOR AN AGE OF CHANGE? - May 26
Dr. Karl W. Bigelow, Director, Commission on Teacher Education, American Council on Education; formerly Professor of Education, Teachers College, Columbia University.

NATIONAL SOCIAL PROBLEMS IN A WORLD COMMUNITY - June 2
Dr. Hornell Hart, Professor of Sociology, Duke University.

****

Dr. Paul Kaufman, Chairman of Lecture Series in the Social Sciences, will preside.

Register in room 4090, South Building, from 8:30 a.m. to 5 p.m.; Saturdays to 2 p.m. Reservations may be made by telephone or mail. Call Republic 4142, extension 317. Enrollment fee, $3.00.

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F - L - I - E - R

The Graduate School
The Department of Agriculture

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A list of additional courses not shown in
the second semester bulletin

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PRINCIPLES OF ADMINISTRATIVE MANAGEMENT (II,III) - Dr. Eldon Lee Johnson, Asst. Chief of the Organization & Planning Section, Office of Personnel; Mon. & Wed. from 5 to 6 commencing March 6th. (2 cr.)

HISTORY OF ART (II,III) - Dr. Fritz Marti, Professor of Philosophy, Univ. of Md.; Monday evenings from 8 to 10 commencing Feb. 13th. (2 cr.)
History of Occidental Art from the Renaissance to the present. (Next fall the course will be continued with an introduction to figurative art and development of style between the third century and the Renaissance.)

VISUAL INFORMATION (III,IV) - Mr. Paul Bissell; Tues. & Fri. from 5 to 6 commencing Feb. 7th. (2 cr.)

QUANTITATIVE MICRO-ORGANIC ANALYSIS (II,III) - Dr. F. E. Smith; Wed. from 5 to 6 commencing Feb. 8th, room 1128. Fee $6. (1 cr.)

TECHNIQUES FOR INVESTIGATING THE ACTIVITIES OF CERTAIN MICRO-ORGANISMS (III) Dr. C. W. Rees. Lectures, Tues. 7:30 to 8:30 a.m.; seminars, Thurs. 7:30 to 9:00 p.m. commencing Thurs. Feb. 16th, room 1555. Fee $12. (2 cr.)

FAMOUS WOMEN OF HISTORY - Mlle. Mary Sabarth; Wed. from 5 to 6 commencing March 6th; lectures. Fee $6.

ROMAN CIVILIZATION (III,IV) - Dr. Katharine R. Adams, visiting Professor of History, American University; Mon. from 5 to 7:30 commencing Feb. 20th. (2-3 cr.)
A survey of the most characteristic and illuminating traits of Roman culture to the decline of the Empire.

MEDIEVAL EUROPEAN HISTORY (IV,V) - Dr. Katharine R. Adams; time to be arranged. Register before Feb. 16th in room 4090 South Building. (2-3 cr.)
A survey of the culture of the period from the end of the Roman Empire to 1600.

MODERN EUROPEAN HISTORY (IV,V) - Dr. Katharine R. Adams; Thurs. from 5 to 7:30 commencing Feb.
The period from 1600 to the present.

HOME GARDENING AND LANDSCAPING - W. R. Beattie; Mon. from 8 to 9 p.m. commencing Feb. 20th. Ten illustrated lectures. Fee $5.
Open to all interested in making home surroundings more beautiful.

GOVERNMENT CORRESPONDENCE (II) - Florence Pool Marks; first meeting at 5 o'clock on Tues. Feb. 7th to arrange hours. (2 cr.)

THE PSYCHOLOGY OF PERSONALITY - Dr. Paul Kaufman; Tues. & Thurs. from 5 to 6 commencing Jan. 31st. Fee $9.

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Detailed information or circulars can be obtained from the Graduate School.

THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE
Washington

The Graduate School announces the following courses -

VOICE DEVELOPMENT - Esther C. King; Wed. and Fri. from 5 to 7* commencing May 17th. First hour in classroom, the second hour in the auditorium. (2 cr.)

Voice development in talking and public speaking, including radio. Individual analysis by the voice recording machine will be available at a nominal fee. The tuition will be $12, excluding any recording fees.

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GOVERNMENT CORRESPONDENCE - Florence Pool Marks; Tues. and Thurs. from 5 to 7*, commencing May 23d. (2 cr.)

The writing of government letters from the organization of the subject matter to the language of the letter; paragraphing, construction of effective sentences, and correct usage. Vocabulary building. Methods for improving expression. Development and application of appraisal standards. Discussion of the problems involved in dictating and reviewing correspondence and supervising letter writers from the standpoint of the stenographer, dictator, reviewer, supervisor, and administrator. Consideration of the procedures to be followed in training for letter writing. Tuition - $12.

* Tentative: hours to be arranged at first meeting

Both courses to run for seven and one-half weeks.

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THE GRADUATE SCHOOL
THE DEPARTMENT OF AGRICULTURE
Washington

F - L - I - E - R

announces a course in

ALGEBRA, to be given by Mr. Harry J. Winslow. Class meets Tuesdays and Thursdays from 4:45 to 6:15, commencing Sept. 28th.

Topics: The fundamental rules of algebra; exponents; logarithms; proportion, manipulation with proportions; identities and conditions; solution of equations; binomial theorem, numerical approximations. Uses of symbols of operations. Determinants; solution of equations by the reciprocal matrix. Theory of equations. Progressions; series. Permutations and combinations. Graphical methods will be illustrated throughout the course.

Prerequisite: High school algebra, plane and solid geometry. (The last-named subject may be taken concurrently; see below.)

* * * * *

A ten week course in SOLID GEOMETRY will be given under Mr. Winslow on Mondays and Wednesdays from 5 to 6 commencing October 11th. Fee $8. This course is designed to fulfill the needs of students in algebra and statistics. Register at the Graduate School before October 10th.

* * * * *

Other mathematical and statistical courses include

CALCULUS
HIGHER ALGEBRA (fall)
COORDINATE GEOMETRY AND VECTORS (spring)
THEORY OF INFINITE PROCESSES
MATHEMATICS OF FINANCE
ANALYTICAL MECHANICS

INTRODUCTION TO STATISTICAL ANALYSIS (both semesters)

MACHINE METHODS IN STATISTICS
STATISTICAL TREATMENT OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES
INDEX NUMBERS & TIME SERIES
CORRELATION
GRAPHIC CORRELATION
ANALYSIS OF VARIANCE
INTERPRETATION OF STATISTICAL CALCULATIONS

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Register at the Graduate School Office, room 1031. Detailed description of the courses are shown in the general catalog, obtainable on request; Agriculture, Branch 317.

DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

F - L - I - E - R

HISTORY OF ECONOMIC THOUGHT - Dr. Max J. Wasserman; Mon. and Wed. at 5 p.m. (2 or 3 credits) Room 0344, South Building.

This course will examine the principal economic theories from Greek antiquity to the present time in the light of the institutions, customs and practices which conditioned them. Special attention will be devoted to the following schools of thought and authors: Greek antiquity; Plato and Aristotle. The Middle Ages: St. Thomas Aquinas, Albertus Magnus, Oresme. The Mercantilists: Sir William Petty, Mun, Child, Montchretien, Bodin, Lord North. The Physiocrats: Quesnay, Mirabeau, Du Point, Riviere. The Classical School: Adam Smith, Ricardo, James Mill, Senior, John Stuart Mill. The Socialists: LaSalle, Marx, Proudhon. The German Historical School: Knies, Hillebrand, Wagner. The Austrian School: Von Wieser, Bohm-Bawerk, Jevons, Walras. The New-Classical School: Alfred Marshal. Recent and modern developments: Monopolistic and imperfect competition, purchasing power economic theory.

CONTEMPORARY ECONOMIC POLICIES AND PROBLEMS - Dr. Max J. Wasserman; Tues. and Thursday at 5. (2 or 3 credits) Room 6709 South Building.

The object of this course is to analyze in some detail the various types of economic policies which are now being used or have been proposed for giving direction and plan to modern economic organization. It will spend some time in a discussion of the theoretical and practical aspects of our major economic problems, placing each problem and policy in its historical setting and analyzing the economic principles involved. A critical evaluation of the various solutions will be made as to the value of each policy. The course will begin with a brief background discussion, tracing the development of modern economic society and showing the important economic problems which develop as institutions change. Among other topics the following will be studied:

I. The fundamentals of a national economic organization
II. Selected labor problems
III. Selected problems in field of money, banking and credit
IV. Selected agricultural problems
V. The federal regulation of business

NOTE: Should other specific questions interest sufficient members of the class, they will be included in the years discussion.

EUROPEAN AGRICULTURE - Mr. Gordon P. Boals; Thurs. 5-6:45 (2 cr.) Commencing October 19.

FIRST SEMESTER. A survey of the production, trade and government policies relating to agriculture in the various European countries with particular attention directed to the competition and demand situation for U. S. farm products. Special consideration will also be given to current war developments as they may affect the European Agricultural situation.
SECOND SEMESTER. Continuation of the first semester with special emphasis given to European commodity surveys following the country by country discussions.

U. S. DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

F - L - I - E - R

New Course in Statistics (non-mathematical)

INTRODUCTION TO STATISTICAL ANALYSIS (Grade I)

Dr. Richard O. Lang, Mondays and Wednesdays commencing November 20th at 5 o'clock in Room 2862. (2 cr.)

This will be an elementary course, non-mathematical, designed for statistical clerks and others who wish to become familiar with some common statistical terms and procedures. Routine calculations and methods of checking will be studied. The course will include the presentation of data in the social sciences, business, and the natural sciences; also the presentation of the results of calculations in tables and charts.

No prerequisites

Text--A. E. Waugh, Elements of Statistical Methods, and Laboratory Manual - (McGraw-Hill, 1938).

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DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

F - L - I - E - R

The first lecture of the series by Dr. Jean Dufrénoy, scheduled for Monday, January 2, at 8 p.m. in the Department of Agriculture Auditorium, will begin at 7 p.m. instead of 8 p.m.

This change is necessary to enable those who desire to attend the Botanical Society meeting that evening at the Cosmos Club to do so. All of the other lectures will be from 8 to 9 p.m. as scheduled.

Register in advance in Room 1031, South Building.

F - L - I - E - R

New Courses in Mathematics and Statistics

INTRODUCTION TO STATISTICAL ANALYSIS, section a (grade I) - Dr. Otis A. Pope; Mon. & Wed. at 4:45 commencing Nov. 15th and ending in March. (2 cr.) An additional seminar will be held Thursdays at 3 o'clock for consideration of special research problems; this seminar is optional, giving one additional credit to those who complete the assignments. The course is for students of the plant and animal sciences who wish an introduction to certain of the newer experimental designs and the proper analyses. It is non-mathematical and is designed particularly as a forerunner to Dr. Brandt's course. The topics are: Randomized blocks, Latin squares, factorial designs, and pseudo factorial designs. No mathematical prerequisites.

STATISTICAL TREATMENTS OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (grade III) - Dr. A. E. Brandt; Tues. & Thurs. at 4:45 commencing Nov. 16th and ending in March. Special emphasis will be placed on the design of experiments, and the statistical analysis of the observations. The concept of independent comparisons or individual degrees of freedom will be used. The principles of the design of experiments and the analyses proper thereto will be emphasized. Randomized blocks, Latin squares, factorial and pseudo-factorial designs will be discussed in detail; also confounding and partial confounding; examination of methods of analyzing data from experiments involving these methods. A seminar supplementing the lectures will be held on Fridays at 3 o'clock at which specific problems relating to research of interest to class members will be discussed. One hour additional credit will be given to those who carry out the special reading and calculations to be advised.

Prerequisites: High school algebra. Opportunities will be provided in the use of more mathematics for those who are qualified.

New Courses

SAMPLING METHODS IN SOCIAL AND ECONOMIC DATA (grade III) - Messrs. J. Stevens Stock and Lester R. Frankel; Fridays from 5 to 7, with an intermission, commencing Feb. 2d. Theory, history, and present day applications of the representative method. Accuracy and precision. Fallacies of the total count. Selections of the sample. Sampling without replacement. The analysis of variance in making estimates of precision. Choice of sampling units. Prerequisites: College algebra and intermediate statistics will be presupposed; calculus will be required of those taking the course for credit.

(over)

THEORY OF PROBABILITY (grade III) - Mr. M. A. Girshick; Wednesdays from 6:30 to 8:30 p.m., commencing Feb. 7th. (2 cr.) An introductory course in mathematical probability, dealing with definitions and fundamental operations, Bayes' formula and Laplace's generalization, Bernoulli's theorem, law of large numbers (Bernoulli and DeMoivre), expectations. Continuous variables, the normal curve, and introductory topics in statistics. Some history. Prerequisites: College algebra and calculus. (Math. 1, 3, 4).

COORDINATE GEOMETRY AND VECTORS (grade III) - Dr. S. B. Littauer (Naval Academy); Tuesdays from 5 to 7, commencing Feb. 6th. Offered this and alternate years. (2 cr.) Lines, planes, conics, quadric surfaces. Tangents, normals, transformations, invariants. Determinants will be used freely. Problems in multiple correlation and curve fitting, and the near indeterminancy of linear equations, will be examined geometrically. The vector notation will be studied, and many of the equations involving tangents and normals will be compressed by vector notation. Prerequisites: Mathematics 1, 2, 3, 4.

F - I - I - E - R

DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

1939-40

Your attention is called to the list of courses now available in the Graduate School of the department. The catalog may be obtained by calling at room 1031 South Building, or by sending a department circulation envelope with the slip at the bottom of this flier.

These courses are designed to be of assistance to department workers.

The office of the Graduate School is open every day of the week, except Saturday until 5:45 p.m., for consultation or registration. Registration should be completed by the 27th of January. A number of new courses have been included in the available list in the general fields of Accounting, Botany, Chemistry, Clerical and Secretarial, Economics, Engineering, English, Literature and Drama, Geography, Graphic Presentation, History, Landscape Design, Languages, Management, Mathematics, Meteorology, Music, Philosophy, Psychology, Sociology, Shorthand and Stenotypy Development, Speech, Statistics, Writing, etc.

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The Graduate School
Department of Agriculture
Room 1031 South Building

Send catalog to:

Name_____

Bureau_____

Room_____

1939-40

DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

F - L - I - E - R

Series of Eight Lectures, by the Eminent Cytologist, Dr. Jean Dufrénoy, Professor of Botany, University of Bordeaux, France, Entitled:

THE REACTION OF THE PLANT CELL TO PATHOGENS, VIRUSES, NUTRITIONAL DEFICIENCIES AND PHYSICAL STIMULI

For many years Dr. Dufrénoy has been making a fundamental study of the response of the plant cell to attack by parasitic organisms and other disease-producing agents. His research in the field of experimental cytology has related chiefly to an investigation of changes in cell structure as correlated with the changes in cell metabolism. As a student of cell structure he has endeavored to interpret in terms of cell metabolism the results of the interaction between the several cell constituents. He and other cytologists in France, Germany, and the United States have emphasized the significance of contact surfaces as seats of chemical reaction within the cell. Viewed in this light Dr. Dufrénoy maintains that the cytologist, in his consideration of cell reaction to disease- producing and other stimuli, should aim more towards a study of contacts between cell constituents than that of the constituents as such.

The eight lectures as outlined by Dr. Dufrénoy will cover the following subject matter. Cell Constituents; Vital Staining: materials and technique; Shape of the Vacuole and Type of Staining, as correlated to the Contents of the Vacuolar Solution and to Cell Metabolism; Exchange of Water between Vacuolar Solution and Cytoplasm; Drought Resistance and Hardness; Water-soaking and Susceptibility to Disease; Oxidation Reduction Systems in the Vacuolar Solution; Respiration, Assimilation, and Storage; Chondriome and Plastidome; and Nutritional Aspect of Chloroplast Differentiation.

Auditorium, South Building, Department of Agriculture

January 2d, 3d, 4th, 5th, 9th, 10th, 11th, and 12th, 1940

Fee for the Course - $5.00.

Time: 8 - 9 p.m.

DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

1939-40

F - L - I - E - R

WHEN THE WAR ENDS, WHAT?

Seven competent observers give their slant on Conditions of a Durable Peace. Among them are a Frenchman, a German, a European neutral, Americans with a variety of experience in Europe and the Orient; Catholic, Protestant, Jew; businessman, newspaperman, scholar.

The first of the seven sessions takes place at 5PM on Wednesday, February 28, in the Auditorium.

Tickets ($2.00 for the 7 sessions) are on sale in Room 1031, the office of the Graduate School. Get your tickets today.

The Lecturers and Their Topics:

Wed.	Feb. 28, 5p.m.	Carleton J. Hayes (Author, Political and Cultural History of Modern Europe), NATIONALISM AS A FACTOR IN THE POST-WAR SETTLEMENT.
Wed.	March 6, 5p.m.	Peter Drucker (Author, The End of Economic Man), STRUGGLES FOR POWER DOWN THE DANUBE.
Wed.	March 13, 5p.m.	Stringfellow Barr (President, St. John's College, Annapolis), AMERICA'S STAKE IN A DURABLE PEACE.
Wed.	March 20, 5p.m.	Allen W. Dulles (Co-author, Can America Stay Neutral?), THE EMERGENCE OF POST-WAR AIMS.
Wed.	March 27, 5p.m.	Edward Mead Earle (Institute for Advanced Study, Princeton), MAIN CURRENTS IN AMERICAN FOREIGN POLICY.
Fri.	April 5, 6p.m.	Arnold Wolfers (Master, Pierson College, Yale University), A POSSIBLE PEACE PLAN.
Fri.	April 12, 6p.m.	Andre Philip (University of Lyons) OUTLINES OF POST-WAR EUROPE.

F - L - I - E - R

DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

WHEN THE WAR ENDS, WHAT?

Ever since September, farmers and the staffs of agricultural institutions have been asking themselves, what will be the effect of the war on agriculture? And more and more people are now asking the further question, what kind of a peace will we have when the war is over?

In view of this interest in the developing international situation, the Graduate School of the Department of Agriculture is offering a series of seven lectures on Conditions of a Durable Peace.

The first of these lectures will be held in the Department Auditorium on Wednesday afternoon, February 28, at 5 o'clock. Tickets for the series are $2.00, obtainable at the Office of the Graduate School, Room 1031 South Building.

The lecturers and their topics are:

Feb. 28, 5 p.m.	Carleton J. Hayes (author, Political and Cultural History of Modern Europe), Nationalism as a Factor in the Post War Settlement.
March 6, 5 p.m.	Peter Drucker (author, The End of Economic Man), Struggles for Power Down the Danube
March 13, 5 p.m.	Stringfellow Barr (President, St. John's College, Annapolis), America's Stake in a Durable Peace.
March 20, 5 p.m.	Allen W. Dulles (Co-author, Can America Stay Neutral?), The Emergence of Post-War Aims.
March 27, 5 p.m.	Edward Mead Earle (Institute for Advanced Study, Princeton), Main Currents in American Foreign Policy.
April 5, 6 p.m.	Arnold Wolfers (Master, Pierson College, Yale University), A Possible Peace Plan.
April 12, 6 p.m.	Andre Philip (University of Lyons) Outlines of Post War Europe

DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

F - L - I - E - R 1939-40

PERSONAL DEVELOPMENT - (No credit) Hester Beall Provensen, Chairman; Wed. 5 to 7 p.m. From Feb. 21 to May 22. Fee $12.

The purpose of this course is to develop confidence, poise, grace of movement and ease of speaking by the analysis and correction of individual difficulties. Practice and theory of the art of conversation, vocabulary building, posture, wardrobe planning, make up, and problems of social adjustment.

Classes are conducted as informal discussion groups. Enrollment limited to permit individual attention.

Guest speakers and panel discussions by authorities on related subjects.

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AMERICAN PHILOSOPHY (IV, V, 2 cr.) - Dr. Fritz Marti; Wed. from 5 to 7, or at another hour most suitable to the members of the class. Beginning Feb. 21, 5 p.m. Fee $12.

A survey of American thought from Colonial times to the present. Informal lectures will introduce the student to the ideas which helped to form the American mind. Students working for credit are required to read short selections from the writings of the main thinkers. Students who desire to read more deeply in some specific author are welcome to report on their findings in class. This would help the discussions without turning the course into a display of technicalities. The course is a practical study for daily use.

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Ask for circular describing series of 7 lectures on "WHEN THE WAR ENDS, WHAT?" beginning Feb. 28th.

[illegible] regulation, Office of the Solicitor, Department of Agriculture
"Problems of Administrative Justice and Judicial Controls"

Mar. 18--Lewis Meriam, Brookings Institution
"Current Needs in Federal Personnel Administration"

Mar. 25--Ismar Baruch, Chief of Personnel Classification Division, Civil Service Commission
"Position Classification"

Apr. 1-- Samuel Board, Chief of Division of Qualification and Training, Office of Personnel, Department of Agriculture
"Effective Placement as a Function of Management"

Apr. 8-- Milton Hall, Chief of Training and Research Section, Farm Credit Administration
"Training"

Apr. 15--Roy F. Hendrickson, Director of Personnel, Department of Agriculture
"Discipline, Morale, and Employee Relations"

Apr. 22--James E. Scott, Principal Budget Examiner, Bureau of the Budget
"The Budgeting Process"

Apr. 29--William A. Jump, Director of Finance, Department of Agriculture
"Budget Execution and Supervision of Expenditures"

May 6-- J. Darlington Denit, Chief of Accounting and Bookkeeping Division, General Accounting Office
"Accounting, Post-Audit, and the General Accounting Office"

May 13-- Samuel A. Snyder, Chief of Division of Purchase, Sales, and Traffic, Office of Budget and Finance, Department of Agriculture
"Purchasing Problems" (including a half-hour tour of Central Supply Section of the Department of Agriculture)

May 20-- Conclusion (one hour only)

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F - L - I - E - R

New Course in Statistics (non-mathematical)

INTRODUCTION TO STATISTICAL ANALYSIS (Grade I)

Dr. Richard O. Lang, Mondays and Wednesdays commencing November 20th at 5 o'clock in Room 2862. (2 cr.)

This will be an elementary course, non-mathematical, designed for statistical clerks and others who wish to become familiar with some common statistical terms and procedures. Routine calculations and methods of checking will be studied. The course will include the presentation of data in the social sciences, business, and the natural sciences; also the presentation of the results of calculations in tables and charts.

No prerequisites

Text--A. E. Waugh, Elements of Statistical Methods, and Laboratory Manual - (McGraw-Hill, 1938).

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F - L - I - E - R

New Courses in Mathematics and Statistics

INTRODUCTION TO STATISTICAL ANALYSIS, section a (grade I) - Dr. Otis A. Pope; Mon. & Wed. at 4:45 commencing Nov. 15th and ending in March. (2 cr.) An additional seminar will be held Thursdays at 3 o'clock for consideration of special research problems; this seminar is optional, giving one additional credit to those who complete the assignments. The course is for students of the plant and animal sciences who wish an introduction to certain of the newer experimental designs and the proper analyses. It is non-mathematical and is designed particularly as a forerunner to Dr. Brandt's course. The topics are: Randomized blocks, Latin squares, factorial designs, and pseudo factorial designs. No mathematical prerequisites.

STATISTICAL TREATMENTS OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (grade III) - Dr. A. E. Brandt; Tues. & Thurs. at 4:45 commencing Nov. 16th and ending in March. Special emphasis will be placed on the design of experiments, and the statistical analysis of the observations. The concept of independent comparisons or individual degrees of freedom will be used. The principles of the design of experiments and the analyses proper thereto will be emphasized. Randomized blocks, Latin squares, factorial and pseudo-factorial designs will be discussed in detail; also confounding and partial confounding; examination of methods of analyzing data from experiments involving these methods. A seminar supplementing the lectures will be held on Fridays at 3 o'clock at which specific problems relating to research of interest to class members will be discussed. One hour additional credit will be given to those who carry out the special reading and calculations to be advised.

Prerequisites: High school algebra. Opportunities will be provided in the use of more mathematics for those who are qualified.

New Courses

SAMPLING METHODS IN SOCIAL AND ECONOMIC DATA (grade III) - Messrs. J. Stevens Stock and Lester R. Frankel; Fridays from 5 to 7, with an intermission, commencing Feb. 2d. Theory, history, and present day applications of the representative method. Accuracy and precision. Fallacies of the total count. Selections of the sample. Sampling without replacement. The analysis of variance in making estimates of precision. Choice of sampling units. Prerequisites: College algebra and intermediate statistics will be presupposed; calculus will be required of those taking the course for credit.

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THEORY OF PROBABILITY (grade III) - Mr. M. A. Girshick; Wednesdays from 6:30 to 8:30 p.m., commencing Feb. 7th. (2 cr.) An introductory course in mathematical probability, dealing with definitions and fundamental operations, Bayes' formula and Laplace's generalization, Bernoulli's theorem, law of large numbers (Bernoulli and DeMoivre), expectations. Continuous variables, the normal curve, and introductory topics in statistics. Some history. Prerequisites: College algebra and calculus. (Math. 1, 3, 4).

COORDINATE GEOMETRY AND VECTORS (grade III) - Dr. S. B. Littauer (Naval Academy); Tuesdays from 5 to 7, commencing Feb. 6th. Offered this and alternate years. (2 cr.) Lines, planes, conics, quadric surfaces. Tangents, normals, transformations, invariants. Determinants will be used freely. Problems in multiple correlation and curve fitting, and the near indeterminancy of linear equations, will be examined geometrically. The vector notation will be studied, and many of the equations involving tangents and normals will be compressed by vector notation. Prerequisites: Mathematics 1, 2, 3, 4.

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F - L - I - E - R

Series of Eight Lectures, by the Eminent Cytologist, Dr. Jean Dufrénoy, Professor of Botany, University of Bordeaux, France, Entitled:

THE REACTION OF THE PLANT CELL TO PATHOGENS, VIRUSES, NUTRITIONAL DEFICIENCIES AND PHYSICAL STIMULI

For many years Dr. Dufrénoy has been making a fundamental study of the response of the plant cell to attack by parasitic organisms and other disease-producing agents. His research in the field of experimental cytology has related chiefly to an investigation of changes in cell structure as correlated with the changes in cell metabolism. As a student of cell structure he has endeavored to interpret in terms of cell metabolism the results of the interaction between the several cell constituents. He and other cytologists in France, Germany, and the United States have emphasized the significance of contact surfaces as seats of chemical reaction within the cell. Viewed in this light Dr. Dufrénoy maintains that the cytologist, in his consideration of cell reaction to disease- producing and other stimuli, should aim more towards a study of contacts between cell constituents than that of the constituents as such.

The eight lectures as outlined by Dr. Dufrénoy will cover the following subject matter. Cell Constituents; Vital Staining: materials and technique; Shape of the Vacuole and Type of Staining, as correlated to the Contents of the Vacuolar Solution and to Cell Metabolism; Exchange of Water between Vacuolar Solution and Cytoplasm; Drought Resistance and Hardness; Water-soaking and Susceptibility to Disease; Oxidation Reduction Systems in the Vacuolar Solution; Respiration, Assimilation, and Storage; Chondriome and Plastidome; and Nutritional Aspect of Chloroplast Differentiation.

Auditorium, South Building, Department of Agriculture

January 2d, 3d, 4th, 5th, 9th, 10th, 11th, and 12th, 1940

Fee for the Course - $5.00.

Time: 8 - 9 p.m.

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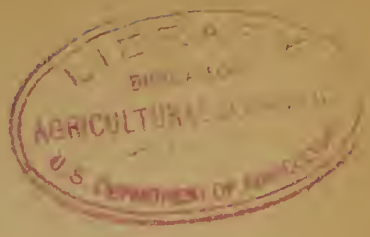

DEPARTMENT OF AGRICULTURE

GRADUATE SCHOOL

Your attention is called to the courses now available in the Graduate School of the department. The catalog may be obtained by calling at room 1031 South Building, or by returning the slip at the bottom of this announcement, with a self-addressed chain envelope.

These courses are designed to be of assistance to department workers.

The office of the Graduate School is open every day of the week, except Saturday, until 5:45 p.m. for consultation or registration, beginning September 9. Telephone inquiries should be made by dialing 5943 or 5944. Registration should be completed by September 21st.

A number of new courses have been included in the available list in the general fields of Accounting, Botany, Chemistry, Clerical and Secretarial, Economics, Editing, Engineering, English, Extension Education, Literature and Drama, Geography, Graphic Presentation, History, Languages, Management, Mathematics, Meteorology, Mineralogy, Philosophy, Psychology, Sociology, Shorthand Development, Speech, Statistics, Writing, etc.

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The Graduate School
Department of Agriculture
Room 1031 South Building

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DEPARTMENT OF AGRICULTURE
Graduate School

LIBRARY BUREAU OF AGRICULTURAL ECONOMICS U.S. DEPARTMENT OF AGRICULTURE

HISTORY OF MODERN EUROPE - (1815 to present time.) (III, 2 cr.) Mr. Simon Krixtein; Wed. 5 to 7 p.m. commencing Oct. 9, or hours to be arranged after first session.

This course is designed to give the student knowledge of the underlying forces dominant in the development of modern Europe since 1815 to the present time, serving as a historical background for better understanding of the great international crises of this generation - the last world war and the present European war.

Mr. Krixtein did his graduate work at Harvard University majoring in History. He came to America and acquired citizenship after the world war.

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STRENGTH OF SHIPS (IV, 2 cr.) Mr. T. L. Vose, Assoc. Naval Architect, Navy Dept.

The course will include the following general subjects: general design methods; longitudinal strength; transverse strength; strength of plating; bulkheads; decks and platforms; foundation fittings; connections and attachments; rudder and rudder posts; etc.

The first meeting of the class will be at 5 p.m. in room 1031 South Building, Dept. of Agriculture, Sept. 25. The class will meet once a week for two hours. The hours will be selected to suit the class.

Registrations should be completed at the office of the Graduate School, Room 1031 South Building, Dept. of Agriculture, by Sept. 21.

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SPECIAL ANNOUNCEMENT OF THE
DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

In view of the greatly increased interest in the many current problems pertaining to Latin America, the Department of Agriculture Graduate School would like to call your attention to the following courses in this general field which will be offered this Fall.

1. *THE ECONOMIES OF THE NATIONS OF LATIN AMERICA (IV, V, 3 cr. each sem.) Dr. Charles F. Sarle; Tues. and Thurs. 5 to 6:30 commencing Sept. 24th. Second Semester on January 28, 1941. (See Graduate School Catalogue, page 10.)

The object of this course is to enable the student to obtain a better perspective concerning the economic organization, resources and trade of the countries of Latin America. Specialists in various fields will lecture and be available for seminar discussions.

The first semester will include a study of the physical and institutional bases of the economies of these countries and a survey of their natural economic resources: physical and economic geography, climate, soils, natural vegetation, tropical diseases, human use regions: roots of Latin American institutions, social relations, transportation, communication, financial institutions, consumption and distribution pattern, labor and cooperative organizations, international trade trends and relationships, government controls of trade and exchange: economic resources - mineral, water power, forest and agricultural.

The second semester will deal with the economic organization, production and trade of individual countries and will consider the development of constructive cultural and economic programs designed to better integrate the economies of the American nations.

2. *LATIN AMERICA AND THE UNITED STATES (IV, 2 cr. each sem.) Mr. Philip Leonard Green; Monday 7 to 9 commencing Sept. 23rd. LECTURES AND CLASS DISCUSSIONS ARE TO BE IN SPANISH. (Not in Catalogue)

This course aims to provide an opportunity to achieve greater facility in Spanish while acquiring useful and interesting information concerning the civilization to which that language is a key, as well as knowledge regarding our relations with the region commonly called Latin America. The course is open to anyone interested in that field, whose command of Spanish is sufficient to enable him to follow lectures in that language. The first semester will be devoted to a consideration of racial, geographic, economical and political influences which have conditioned the development of Latin American thought and action. It will deal with outstanding contributions of Latin Americans in art, literature, political science and other phases of human activity.

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NEW GATEWAYS

to

CREATIVE LIVING

SIX LECTURES

by

HORNELL HART

of

DUKE UNIVERSITY

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OCT 3 1940
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U.S. DEPARTMENT OF AGRICULTURE

Under the Auspices of the

Graduate School
U. S. Department of Agriculture

October 11 to November 15
inclusive — 1940

NEW GATEWAYS to CREATIVE LIVING . . .

Six Lectures by Hornell Hart

We live in the shadows of a menaced civilization. War, famine, pestilence and anarchy loom over the whole world. Dictators stalk across the earth, threatening those who are still free. The national income of America pours into the most gigantic program of preparedness for defense the world has ever seen. The foundations of our economic order are threatened. The traditions of democracy face the stark challenge of regimented aggression. Youth turns from gaity and higher culture to learn the levers of vast instruments of destruction. Darkness seems to be coming down over the age-old struggle of mankind.

But suppose that there were a gateway out of the darkness into the light? Suppose there were a door through which we might step from gloom into glory of hope, of vision and of renewed strength to face the struggle with courage and with confidence. Would you not take the step? Would you not go through the gate?

Dr. Hart offers no flight from reality, but a series of new gateways into reality. He does not suggest ways of dodging the problems of today, but fresh methods of grappling courageously with those problems.

This series will be given by the Graduate School of the Department of Agriculture in the Auditorium of the South Building of the Department on Friday afternoons from 5 to 6 p.m. commencing October 11, 1940.

Tickets for the series are $2.00, obtainable at the office of the Graduate School, Room 1031 South Building. It will be appreciated if reservations are completed before the opening of the lectures.

SUBJECTS OF THE LECTURES

October 11—CREATIVE LIVING IN A DESTRUCTIVE WORLD
October 18—GATEWAYS TO CREATIVITY
October 25—GATEWAYS TO INNER HARMONY
November 1—GATEWAYS TO POWER
November 8—GATEWAYS TO SOCIAL HARMONY
November 15—GATEWAYS TO THE FUTURE

Now Professor of Sociology at Duke University, Dr. Hart served for some years as Chairman of the Committee on Social Research of the American Sociology Society. Among his well-known books are "The Science of Human Relations" and "Personality and the Family." One of the most distinguished speakers in America, Dr. Hart was chosen as the concluding lecturer in three of the public courses presented by the Graduate School of the Department of Agriculture in the past two years. He also gave a series of lectures last year entitled "Scientific Aids to the Achievement of Happiness." Dr. Hart is known and loved by thousands of Washingtonians.

1941

F-L-I-E-R

F-L-I-E-R

General Lecture Series
NEW GATEWAYS TO CREATIVE LIVING

By Hornell Hart
Professor of Sociology at Duke University

In these lectures offered by the Graduate School, Dr. Hart will deal with a problem about which many are vitally concerned today -- the problem of how to face courageously the complex problems of a war-torn and ideologically-disturbed world. Many persons, including government employees, find it difficult to achieve a satisfactory balance in life and to adjust themselves to their work and their associates. Yet such adjustment is necessary for high morale and personal contentment. From his years of study and research in this field, Dr. Hart will suggest new methods of grappling with those problems.

The lecturer needs no introduction. Those who heard him last year can best recommend him. That series is soon to appear in book form. This year's series is entirely new and will probably also be published. Dr. Hart was formerly Chairman of the Committee on Social Research of the American Sociological Society. Among his well-known books are The Science of Human Relations and Personality and the Family.

Tickets for the series are $2.00, obtainable at the office of the Graduate School, Room 1031 South Building. It will be appreciated if reservations are completed before the opening of the lectures.

October 11 -- CREATIVE LIVING IN A DESTRUCTIVE WORLD
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The Graduate School
DEPARTMENT OF AGRICULTURE
Washington

CALCULUS

This course is to be offered this year, contrary to the statement in the catalogue, which announced that calculus will not be offered until next year. (It is due every two years.) The particulars are as follows:

Calculus (II)-- Dr. Joseph F. Daly (Catholic University); Tues. and Thurs. 5 to 6:45 with a few minutes intermission, commencing Oct. 8th. South Building, Department of Agriculture (the room number can be obtained from the Graduate School office on the date of the first meeting). Fee: $18 per semester. Credit: 3 hours per semester.

First semester. Variables, functions, limits, continuity, divided differences, derivatives. Application of the derivative to geometry, physics, curve fitting, and analysis. Mean value theorem. The antiderivative. Riemann integration.

Second semester. Standard integral forms. Partial and total derivatives. Constrained maxima and minima in functions of two variables. Lagrange multipliers. Interpolation. Taylor's series with one or more independent variables. Propagation of errors. Operations with series. Multiple integrals. Line integrals. Approximate integration; the Euler-Maclaurin formula; mechanical integration. Function scales. History and application stressed.

Prerequisites: College algebra and trigonometry.

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The Graduate School
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Offers a Lecture Series on

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THE DEFENSE OF AMERICA

WALTER RAUTENSTRAUCH
Professor of Industrial Engineering, Columbia University

TECHNOLOGY AND DEFENSE
Wednesday, November 27

ADOLF A. BERLE, JR.
Assistant Secretary of State

HEMISPHERE DEFENSE
Friday, December 6

MAX LERNER
Professor of Political Science, Williams College, and Former Editor of *The Nation*

PUBLIC OPINION AND DEFENSE
Friday, December 13

JOHN D. BLACK
Professor of Economics, Harvard University

AGRICULTURE AND DEFENSE
Friday, December 20

To be given in the Department of Agriculture Auditorium at 5 P. M.

Tickets $1.00 for the series obtainable at Room 1031, South Building

THE DEFENSE OF AMERICA

1941

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DEPARTMENT OF AGRICULTURE
GRADUATE SCHOOL

November 25, 1940

A PROBLEM OF VITAL CONCERN TO YOU
will be discussed in the lecture series "The Defense of America," beginning this Wednesday at 5 p.m., Department Auditorium.

Chairman of the series
James L. McCamy, Assistant to the Secretary
and coordinator of the Department's defense activities

TECHNOLOGY AND DEFENSE, Wednesday, November 27. Walter Rautenstrauch, Professor of Industrial Engineering, Columbia University -- Perhaps you read Carl Dreher's much-discussed article, "Why Hitler Wins," in a recent issue of Harper's. If so, you will want to hear the ideas elaborated upon by Dr. Rautenstrauch, who comes to us with a strong endorsement from Mr. Dreher. Suppose we set out unreservedly to harness technology for our defense, what will have to be done? How can we best organize for it? What adjustments will have to be made in our present economy?

HEMISPHERE DEFENSE, Friday, December 6. Adolf A. Berle, Jr., Assistant Secretary of State -- We have only recently come to think of defense on a hemisphere basis. "The Defense of America" really means America in the broadest sense. What are the chief military and economic problems? How are we going about solving them? No one can tell us about them more interestingly and authentically than the Assistant Secretary of State.

PUBLIC OPINION AND DEFENSE, Friday, December 13. Max Lerner, former editor of The Nation and now Professor of Political Science, Williams College -- What the public thinks is happening is often more important that what is actually happening. Public opinion, and hence morale, can be molded by many highly perfected means of communication and techniques of propaganda. A democracy is particularly vulnerable in its sources of opinion because it must act on what its citizens think. A war of ideas is going on abroad. If we escape the war, can we hope to escape the impact of the ideas? Few if any persons are better qualified to discuss these issues than Dr. Lerner, who is author of It is Later than You Think and Ideas are Weapons.

AGRICULTURE AND DEFENSE, Friday, December 20. John D. Black, Professor of Economics, Harvard University -- An outsider was selected to give this lecture in order that persons immersed in the government's agricultural program can get the challenging point of view of a keen spectator and student of agricultural problems. What adjustments must agriculture make for defense purposes and in view of the disappearance of foreign markets? What planning must be done now to make possible speedy adjustment to post-war conditions?

Obtain tickets now in Room 1031, South Building - $1 for the entire series (no individual tickets sold).

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On the Frontiers of the Mind

A COURSE OF SEVEN LECTURES

Presented by

THE GRADUATE SCHOOL
U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON

FRIDAYS AT 5 P. M.

IN THE AUDITORIUM, SOUTH BUILDING

Beginning March 21, 1941

23

On the Frontiers of the Mind

This course presents the most recent approaches to a scientific understanding of human nature.

A limited number of enrollments from other Departments and agencies of the Government and from the general public will be accepted.

Register in Room 1031 South Building from 8:30 a. m. to 5:30 p. m.; Saturdays to 1:00 p. m. Reservations may be made by telephone or by mail. Call REpublic 4142, Extension 5943. Enrollment fee, $2.50.

The Subjects and the Speakers

The Place of Mind in the Expanding Universe —*March 21*

WM. PEPPERELL MONTAGUE, Ph.D.

Professor of Philosophy in Barnard College, Columbia University; Past President, American Philosophical Association; Author, "New Ways of Things," etc.

Emotions and Their Influence on the Body —*March 28*

FLANDERS DUNBAR, M.D., Ph.D.

Associate in Psychiatry, College of Physicians and Surgeons, Columbia University; Author, "Emotions and Bodily Changes"; Editor, "Psychosomatic Medicine."

From Intellect to Intuition —*April 4*

ALICE A. BAILEY

Author, "The Soul and Its Mechanism," "The Consciousness of the Atom," "From Intellect to Intuition," etc.

Where Research in Extra-Sensory Perception Is Leading —*April 11*

J. B. RHINE, Ph.D.

Professor of Psychology, Duke University; Author, "Extra-Sensory Perception," "New Frontiers of the Mind," etc.

The Ways of the Unconscious —*April 18*

GREGORY ZILBOORG, M.D.

Practicing Psychiatrist, New York City; Past President, New York Society for Medical History; Author, "The Medical Man and the Witch during the Renaissance," etc.

Light from the Ancient East on Self-Discovery —*April 25*

CLAUDE BRAGDON

Fellow, American Institute of Architects; Author, "Old Lamps for New," "Four-Dimensional Vistas," "More Lives Than One" (autobiography), etc.

Toward Unity in the Science of Consciousness —*May 2*

PAUL KAUFMAN, Ph.D.

Lecturer in Psychology, The Graduate School.

A reading list covering the subjects of the lectures will be made available for those enrolling in the course.

In the Search for Light

on the problems that press for solution we must seek the guidance of increasing knowledge provided by all the sciences. Yet the center of understanding must be a growing insight into human nature itself.

This course presents a wide range of approaches to that understanding.

A. F. Woods,
Director.

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Jan. 8, 1941
JUL 2 1941

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DEPARTMENT OF AGRICULTURE

Dr. A. H. Reginald Buller of Winnipeg, Canada, botanist and well-known authority on the fungi, has been engaged by the Graduate School of the Department of Agriculture to lecture before botanists and plant pathologists of the Department, and of local universities and colleges.

Subject of the lecture: Hyphal fusions and protoplasmic streaming in the higher fungi.

Place: Department of Agriculture Agriculture Auditorium.

Day and hour: Wednesday, January 8, 5:00 - 6:00 p.m.

Ticket: 75 cents. [1941]

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May 11-14, 1941
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Graduate School
U. S. Department of Agriculture
Washington, D.C.
May 11-14, 1941.

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An exhibition and demonstration of Art Weaving, held under the auspices of the Graduate School of the Department of Agriculture will open in the Patio of the Administration Building, Department of Agriculture, on Sunday, May 11 at 2 P.M.

Among the types of hand-woven articles displayed will be examples of tapestries, wall hangings, upholstery, bags, and scarfs done in Aubusson, Gobelin, Egyptian and Art Weaving. To illustrate methods used in making the articles there will be demonstrations of Aubusson, French Gobelin, and Art Weaving.

Exceptionally fine examples of weaving done by Madam Henderikus van der Meiden, under whose direction the class has been conducted, will also be displayed. Her beautiful French Gobelin tapestry, "The Story of Prince Charming" was awarded first prize in June 1938 at a large exhibition of painting and handicrafts held under the auspices of the Chamber of Commerce in Los Angeles.

Madam van der Meiden recently held a one-man show at Rockefeller Center in New York City which attracted widespread attention. She has travelled extensively throughout Europe, India, Central America, and Mexico where she studied the traditions and folklore of the natives and in many instances adapted their designs to modern weaving.

The exhibition will continue through May 14.

The hours of the exhibition are:

Week days -- 9 A.M. to 5 P.M.

Sunday -- 2 P.M. to 5 P.M.

JUL 2 1941

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GRADUATE SCHOOL
DEPARTMENT OF AGRICULTURE

June 2, 1941

COURSES OFFERED DURING THE SUMMER SESSION

Intermediate Spanish (2 cr.) - Dr. Madaline W. Nichols, Research Assistant, Committee on Latin American Studies; Reference Assistant, Hispanic Foundation, Library of Congress.

This is the second semester of the beginning course. The class will meet on Mondays for fifteen weeks from 5 to 7, commencing June 9. Fee $12.

Elementary Spanish (2 cr.) - Miss Olivia Russell, M.A. and all but thesis completed for Ph.D. in Romance Languages, Columbia University.

The course will meet on Mondays and Wednesdays for ten weeks from 5 to 6:30, commencing June 9. Fee $12.

A course in Public Speaking will also be offered, commencing June 9. Further information may be obtained from the Graduate School.

Register in Room 1031, South Building. The School office will adhere to Department hours during the summer months.

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