

BULLETIN
University of Kentucky



Graduate School

1950-51

July, 1950

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No. 7

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* Resigned, June 30, 1950.

BULLETIN

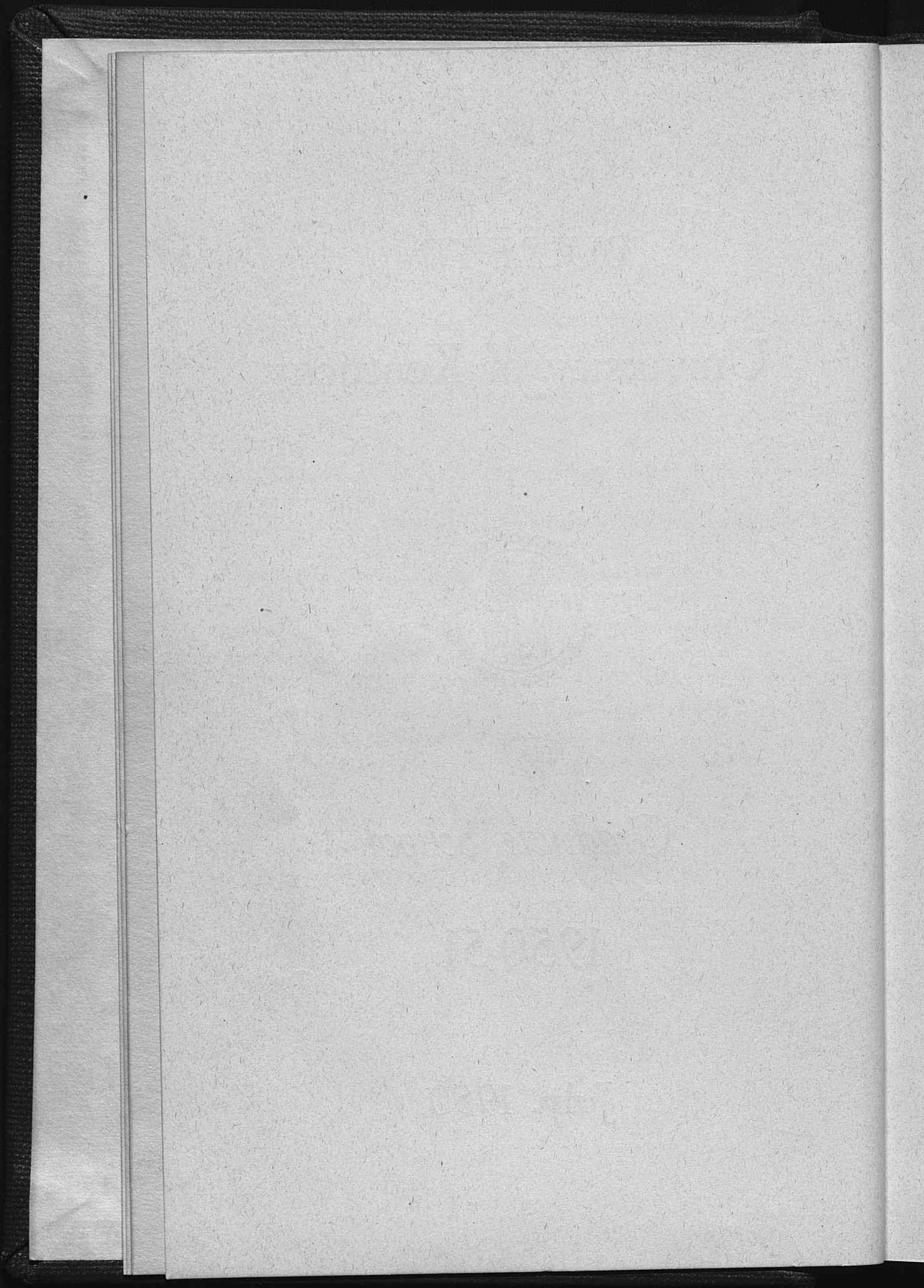
University of Kentucky



Graduate School

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UNIVERSITY CALENDAR FOR THE YEAR 1950-1951

FIRST SEMESTER

September 11-13	Monday, 8:00 a.m. to Wednesday 5:00 p.m.— Classification tests and physical examinations for all new students
September 14-16	Thursday, 8:00 a.m. to Saturday noon — Registration and classification of all students, according to an alphabetical schedule
September 18	Monday — Class work begins
September 23	Saturday — Last date one may enter an organized class for the first semester
October 13-14	Friday and Saturday — Period for filing application for degree
October 23	Monday — Last date one may drop a course without a grade
November 23-27	Thursday, 8:00 a.m. to Monday, 8:00 a.m.— Thanksgiving holidays
December 16	Saturday noon — Christmas holidays begin

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January 2	Tuesday, 8:00 a.m.— Christmas holidays end
January 22-26	Monday through Friday — Final examinations
January 26	Friday, 6:00 p.m.— End of first semester

SECOND SEMESTER

February 3	Saturday, 7:45 a.m.— Classification tests and physical examinations of all new students
February 5-6	Monday, 8:00 a.m. to Tuesday, 4:20 p.m.— Registration and classification of all students, according to an alphabetical schedule
February 7	Wednesday — Class work begins
February 13	Tuesday — Last date one may enter an organized class for the second semester
March 2-3	Friday and Saturday — Period for filing application for degree
March 12	Monday — Last date one may drop a course without a grade
March 23-27	Friday, 8:00 a.m. to Tuesday, 8:00 a.m.— Easter holidays

May 27	Sunday — Baccalaureate Services
May 29-June 2	Tuesday through Saturday — Final examinations
June 1	Friday — Eighty-third Annual Commencement
June 2	Saturday, 6:00 p.m.— End of second semester
June 6-10	Tuesday through Saturday — 4-H Club Week

SUMMER SESSION 1951

June 18	Monday, 7:45 a.m.— Classification tests and physical examinations for all new students
June 19	Tuesday, 8:00 a.m. to 4:30 p.m.— Registration and classification of all students, according to an alphabetical schedule
June 20	Wednesday — Class work begins
June 23	Saturday — Last date one may enter an organized class for the summer session
June 28	Thursday — Last date one may drop a course without a grade
June 29-30	Friday and Saturday — Period for filing application for degree
July 4	Tuesday — Independence Day holiday
August 10	Friday — Summer Session Commencement
August 11	Saturday noon — End of summer session

FIRST SEMESTER 1951-1952

September 10	Monday — Opening of first semester
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GRADUATE FACULTY

HERMAN LEE DONOVAN, A.B., M.A., Ph.D., LL.D.
President of the University

LOUIS ARTHUR PARDUE, A.B., M.S., Ph.D.
Dean of the Graduate School

MARGARET HOTCHKISS, Ph.D.
Secretary, Graduate Faculty

RICHARD SWEETNAM ALLEN, M.S.	Anatomy and Physiology
CHARLES BARKENBUS, B.S., Ph.D.	Chemistry
HOWARD W. BEERS, B.S., M.S., Ph.D.	Rural Sociology
ADOLPH E. BIGGE, M.A., Ph.D.	German
GEORGE K. BRADY, A.B., M.A., Ph.D.	English
ALFRED BRAUER, M.A., Ph.D.	Zoology
AUBREY J. BROWN, M.S., Ph.D.	Markets and Rural Finance
JAMES CALVIN, Ph.D.	Psychology
CECIL C. CARPENTER, M.S., Ph.D.	Economics
LUCIAN HUGH CARTER, M.A., Ph.D.,	Commerce
LEO MARTIN CHAMBERLAIN, M.A., Ph.D.	Education
JOHN SHARP CHAMBERS, M.S., M.D.	Hygiene and Public Health
THOMAS D. CLARK, A.B., A.M., Ph.D., Litt.D.	History
ARTHUR L. COOKE, M.A., Ph.D.	English
*CLYDE B. CRAWLEY, M.S., Ph.D.	Physics
CHARLES STEVENS CROUSE, E.M.	Engineering
LYLE R. DAWSON, Ph.D.	Chemistry
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GRAHAM B. DIMMICK, Ph.D.	Psychology
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W. CLEMENT EATON, Ph.D.	History
STATIE ESTELLE ERIKSON, Ph.D.	Home Economics
EDWARD FRANKLIN FARQUHAR, M.A.	English
ERNEST NEWTON FERGUS, Ph.D.	Agronomy
WESLEY PATTERSON GARRIGUS, Ph.D.	Animal Husbandry
CARSIE HAMMONDS, M.S., Ph.D.	Education
ELLIS FORD HARTFORD, M.A., Ed.D.	Education
MARGARET HOTCHKISS, Ph.D.	Bacteriology
HERBERT H. HUMPHREYS, Ph.D.	Psychology
PERRY ELMER KARRAKER, M.A.	Agronomy
GRANT COCHRAN KNIGHT, M.A.	English
OTTO TOWNSEND KOPPIUS, B.S., Ph.D.	Physics
JOHN KUIPER, M.A.	Philosophy
SHELBY T. MCCLOY, Ph.D.	History
ARTHUR CRANE MCFARLAN, A.B., Ph.D.	Geology
FRANK T. MCFARLAND, Ph.D.	Botany

* Died October 26, 1949.

JAMES W. MARTIN, M.A.	Economics
WILLIAM DURRETT NICHOLLS, M.S., Ph.D.	Farm Economics
FRANK A. PATTIE, M.A., Ph.D.	Psychology
SALLIE E. PENCE, M.A., Ph.D.	Mathematics
HUGH BRUCE PRICE, Ph.D.	Markets and Rural Finance
EDWARD WARDER RANNELLS, B.A., M.A.	Art
HERBERT PARKS RILEY, M.A., Ph.D.	Botany
HARRY ALEX ROMANOWITZ, E.E., M.S., Ph.D.	Engineering
L. HOBART RYLAND, A.B., M.A., Docteur de l'Universite ...	Romance Languages
IRWIN T. SANDERS, Ph.D.	Sociology
MORRIS SCHERAGO, B.S., D.V.M.	Bacteriology
J. R. SCHWENDEMAN, Ph.D.	Geography
DON CASH SEATON, M.A., Ph.D.	Physical Education
MAURICE F. SEAY, M.A., Ph.D., LL.D.	Education
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JASPER BERRY SHANNON, Ph.D.	Political Science
JONAH W. D. SKILES, M.A., Ph.D.	Ancient Languages
HERBERT SORENSON, M.A., Ph.D.	Education
DUDLEY EUGENE SOUTH, M.A., Ph.D.	Mathematics
HERMAN EVERETT SPIVEY, M.A., Ph.D.	English
ELVIS J. STAHR, JR., M.A., A.B. in Jur., B.C.L.	Law
OLUS JESSE STEWART, A.B., M.S., Ph.D.	Chemistry
RODMAN SULLIVAN, A.B., A.M., Ph.D.	Economics
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LEE HILL TOWNSEND, Ph.D.	Agricultural Entomology
AMRY VANDENBOSCH, Ph.D.	Political Science
WILLIAM SMITH WARD, M.A., Ph.D.	English
RALPH HOLDER WEAVER, M.S., Ph.D.	Bacteriology
WILLIAM SNYDER WEBB, M.S., Sc.D.	Physics
HAROLD E. WETZEL, B.Sc. in S.A., M.A.	Social Work
MARTIN MARSHALL WHITE, M.A., Ph.D.	Psychology

* Died August 26, 1949.

THE GRADUATE SCHOOL

LOUIS ARTHUR PARDUE, A.B., M.S., PH.D., DEAN

INTRODUCTORY STATEMENT

Graduate work is offered in all colleges in the University. Approximately a thousand courses are listed in the catalogue, under the various departments, which are accepted for graduate credit.

The following advanced degrees are conferred by the University:

- Master of Arts
- Master of Science
- Master of Science in Public Health
- Master of Science in Agriculture
- Master of Science in Home Economics
- Master of Science in Civil Engineering
- Master of Science in Electrical Engineering
- Master of Science in Mechanical Engineering
- Master of Science in Metallurgical Engineering
- Master of Science in Mining Engineering
- Civil Engineer (C.E.)
- Electrical Engineer (E.E.)
- Mechanical Engineer (M.E.)
- Metallurgical Engineer (Met.E.)
- Mining Engineer (E.M.)
- Master of Arts in Education
- Master of Science in Education
- Doctor of Education (Ed.D.)
- Doctor of Philosophy

The degree of Doctor of Philosophy is offered with major work in the following fields: Agricultural Economics, Bacteriology, Chemistry, Education, Economics, English, History, Mathematics, Physics, Psychology, Political Science, Romance Languages, and in the combined fields of Sociology and Rural Sociology. Minor work may be carried in any department offering graduate courses.

ADMISSION

A student who is a graduate of a fully accredited institution of higher learning may be admitted to the Graduate School by the Registrar of the University by submitting an official transcript of undergraduate courses and a written application. Blanks for the latter may be obtained from the Registrar or from the office of the Graduate School.

It should be clearly understood that a graduate student may not be able to begin immediately a full graduate program leading to the degree he desires.

It may be necessary for him to satisfy certain prerequisites which he omitted in his undergraduate curriculum. These will be determined by the department in which the major work is to be done. In brief it may be stated that a graduate student may begin a full program in the fields in which he has the equivalent of an undergraduate major; in some cases the equivalent of an undergraduate minor is adequate.

If the record submitted to the Registrar entitles the applicant to admission, he should confer with the Dean of the Graduate School about general requirements and with his major professor concerning detailed requirements that he may have to satisfy.

Members of the faculty of the University of Kentucky having a rank higher than that of instructor may not be considered as candidates for advanced degrees from this institution.

GENERAL REQUIREMENTS FOR ALL ADVANCED DEGREES

Courses

All courses listed in the regular University catalogue which have numbers above 100 may be counted as credit toward a graduate degree; however, courses numbered from 100 to 199 may be counted only with the approval of the student's graduate committee. A course completed with a grade of D will not be given graduate credit.

Residence

A load for full-time residence comprises a minimum of 9 semester hours of graduate course work. In the summer session the corresponding load is 6 semester hours. Part-time residence during any semester is computed on the basis of one and one-half weeks of residence for each semester hour earned, but the amount of residence for part-time work is limited, except for graduate assistants and part-time instructors, to not more than six weeks in any one semester. These receive one and one-half weeks of residence per semester hour. Part-time students in the summer session receive one and one-half weeks per semester hour except for short courses of less than eight weeks in which case residence shall not exceed the actual number of weeks involved.

Fees

Registration fees per semester are the same as for undergraduate students in the college in which the major work is done, that is, \$60.00 for residents of Kentucky; \$90.00 for non-residents who registered before September 1, 1947; \$120.00 for those who registered after September 1, 1947. Part-time graduate students who are legal residents of the state pay \$6.75 per semester hour; non-residents who registered before September 1, 1947 pay \$10.25 per semester hour; non-residents who registered after September 1, 1947 pay \$13.50 per semester hour. Students carrying full loads in the summer session pay one-half the regular semester fee. Those taking less than full loads pay the regular semester credit hour fee.

GENERAL REQUIREMENTS FOR ALL MASTERS' DEGREES

Transfer of Credits

No transferred credits are accepted toward any master's degree in course; however, a student is not asked to repeat a course which he has satisfactorily completed at another institution.

Extension

Under certain conditions, up to one-third of the credits and residence required for any master's degree in course may be satisfied by extension courses given in person by University of Kentucky instructors. No graduate credit is given for courses taken by correspondence.

M.A. or M.S. Degree

Whether a candidate selects a Master of Arts or a Master of Science degree is left to the option of the candidate and his major department. In general it may be said that a candidate with major work in the natural sciences should take the M.S. degree; others, the M.A.

Examinations

A final oral examination is given all candidates for masters' degrees in course, not later than fifteen days before the close of the semester. The Dean of the Graduate School appoints examining committees of at least three members each for the purpose, selecting the members from the major and minor professors under whom the work was done. The Dean is ex officio a member of all such examining committees. The candidate is asked to defend his thesis, if one has been written, and is examined on any subject matter related to his field.

Fees

Before any master's degree is conferred, a commencement fee of \$20.00 must be paid at the Comptroller's Office of the University.

REQUIREMENTS FOR THE DEGREES OF MASTER OF ARTS AND MASTER OF SCIENCE

Credits

The candidate shall complete a minimum of 24 semester hours of graduate course work with a standing of 2.0 or better. Additional courses may be assigned by the candidate's adviser.

Courses

The candidate shall have a major field which shall comprise at least two-thirds of the course work; the other one-third may be taken in that field or in fields which have graduate relationship with it. In education and agriculture only one-half of the work must be in the major field.

Residence

The minimum residence required is one academic year of 36 weeks. This residence may be fulfilled by any combination of semesters or summer sessions which totals the required number of weeks.

This does not mean that the work prescribed for each individual can always be completed in the minimum length of time. Inadequate preparation or assistance in departments very frequently makes a longer period necessary.

Thesis

A thesis is required of every candidate. Two type-written copies of the thesis, approved by the professor in charge and in a form acceptable to the Graduate School, must be presented not later than three weeks before the last day upon which grades may be reported to the Registrar's Office. The final oral examination may not be taken before the thesis has been accepted by the Graduate School Office. *Information about this thesis deadline date may be obtained from the Graduate School Office.*

Language Requirements

A reading knowledge of at least one modern foreign language is required. This language should be pertinent to the program of the student and approved by his adviser. The language requirement must be satisfied by an examination given by the foreign language department of the University offering instruction in the language concerned. The passing of this examination may satisfy one of the two language requirements for the doctorate if approved by the student's special committee.

REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN EDUCATION

See Education, page 120.

**REQUIREMENTS FOR THE DEGREES OF MASTER OF SCIENCE
IN AGRICULTURE AND MASTER OF SCIENCE IN
HOME ECONOMICS**

Students holding a bachelor's degree from a standard agricultural college may obtain the degree of Master of Science in Agriculture or Master of Science in Home Economics by satisfying the following requirements:

1. The completion of 24 semester hours of graduate work with an average standing of 2.0 or better, 36 weeks in residence, and a thesis, or the completion of 36 semester hours of graduate work with a standing of 2.0 or better, 45 weeks in residence, and no thesis requirement.
2. Under either plan no grade below C may be counted.
3. One-half of the work must be in one department, the remainder in any other department or departments approved by the major professor.
4. There is no language requirement for either of these professional degrees.

In either case a final oral examination is given the candidate not later than 15 days before the close of the semester in which the degree is to be secured. The candidate is expected to show a comprehensive knowledge of the subject matter related to the field of his major work and in case a thesis has been prepared to defend same.

Graduate students in the College of Agriculture fall into four groups:

Group I.—Those who have presented the degree Bachelor of Science in Agriculture or Home Economics and plan to prepare a thesis under the direction of a major professor in their graduate work.

Group II.—Those who do not have the degree of Bachelor of Science in Agriculture or Home Economics and plan to prepare a thesis. Such students may not have had certain essential undergraduate work. In such cases the major professor will recommend to the graduate committee a plan to strengthen the student in such weaknesses. When approved by the committee this plan will become the basis of the student's graduate program.

Group III.—Those students who have the degree Bachelor of Science in Agriculture or Home Economics and request the option to omit the thesis and present 36 semester hours in graduate courses and 45 weeks of residence. Such students will be assigned a graduate adviser who will aid them in preparing a program for graduate work. The program will be submitted to the Graduate Committee for approval early in the student's residence period.

Group IV.—Those students who do not have the degree Bachelor of Science in Agriculture or Home Economics and who request the option to omit the thesis and present 36 semester hours in graduate courses and 45 weeks of residence. Students in this group will be assigned a graduate adviser who will aid them in preparing a statement of the candidate's program for the master's degree. Approval of this program by the Committee must be obtained early in the student's residence period. Candidates in Group IV should take one or more courses, preferably advanced courses, in each department of the College of Agriculture in which there is a required course for the Bachelor of Science in Agriculture or Home Economics.

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN PUBLIC HEALTH

Students holding a bachelor's degree from a fully accredited institution or the M.D. degree from a recognized Medical School may obtain the degree of Master of Science in Public Health by satisfying the following requirements:

1. Twenty-four semester hours in graduate courses with an average standing of 2.0 or better.
2. No grade below C may be counted.
3. Thirty-six weeks in residence.
4. An acceptable thesis.
5. There is no language requirement for this degree.

REQUIREMENTS FOR ADVANCED DEGREES IN ENGINEERING

Two classes of advanced degrees are offered in the College of Engineering, the masters' degrees and the professional degrees.

THE MASTERS' DEGREES IN ENGINEERING. The masters' degrees in engineering may be obtained by satisfying the following requirements:

1. Twenty-four semester hours in graduate courses with an average standing of 2.0 or better.
2. No grade below C may be counted.
3. Thirty-six weeks in residence.
4. An acceptable thesis.
5. Two-thirds of the work must be in the major subject.
6. There is no language requirement for these degrees.

The candidate must hold the corresponding Bachelor of Science degree in engineering or the equivalent from this institution or from another engineering school of recognized standing. The degrees offered are Master of Science in Civil Engineering, Master of Science in Electrical Engineering, Master of Science in Mechanical Engineering, Master of Science in Metallurgical Engineering, Master of Science in Mining Engineering.

THE PROFESSIONAL DEGREES IN ENGINEERING. The professional degrees of Civil Engineer (C.E.), Electrical Engineer (E.E.), Mechanical Engineer (M.E.), Metallurgical Engineer (Met.E.), or Mining Engineer (E.M.) will be granted only to graduates of the University of Kentucky, College of Engineering, who present satisfactory evidence of professional work of creditable quality in the engineering fields of their choice, extending over a period of five years, and who submit satisfactory theses as further evidence of their professional attainments.

A candidate holding a master's degree in engineering shall be considered to have fulfilled two years of the five-year requirement for the corresponding professional degree.

An application for a professional degree must be made to the Dean of the Graduate School and have the approval of the Graduate Committee of the College of Engineering not less than one academic year before the degree may be granted.

The Graduate Committee will pass on the qualifications of each applicant. It may, at its discretion, require an oral examination. The applicant is expected to submit a record of his engineering experience, which should include a complete list of his professional engagements, showing in each case the length of time employed and the position held. He should give for references the names of at least three persons who are familiar with his engineering work. Preferably these persons should be connected with the organizations by whom he has been employed.

A thesis is required of each candidate. It may be in the field of research, design, invention or engineering processes and methods. It must contain some original thought and be the product of the individual submitting it. Quotations and references with proper credit may be used. In general, the thesis should be of such a nature that it will be of value to the engineering profession.

A candidate holding a bachelor's degree in one field of engineering may apply for a professional degree in another field of engineering if he has attained unusual prominence and success in that field.

Fees

The fees for a professional degree in engineering are \$15.00 for registration and \$20.00 for graduation.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is conferred upon a candidate who, after completing not less than three years of graduate work devoted to the study of a special field of knowledge, presents a satisfactory dissertation and passes a comprehensive examination, thus, qualifying for recognition as a scholar of high attainments in his chosen province.

The doctor's degree is intended to represent not a specified amount of work covering a specified time, but the attainment, through long study, of independent and comprehensive scholarship in a special field. Such scholarship should be shown by a thorough acquaintance with present knowledge in a particular field of learning and a marked capacity for research.

Admission

Admission to the Graduate School and acceptance of advanced credits from other institutions must first be approved by the Registrar who will determine at the time of admission the amount of residence to which the applicant is entitled toward the degree of Doctor of Philosophy. No work is credited which has not been done in a college or university of recognized standing.

In order to be accepted as an applicant for the degree of Doctor of Philosophy, a student must present to the Registrar evidence that he has completed an undergraduate curriculum and has received his baccalaureate degree from a fully accredited institution.

Classification

A student wishing to become an applicant for the doctor's degree must first regularly register in the Graduate School of the University of Kentucky and must then classify with the Dean of the Graduate School. The student is expected to select his major professor as early as is practicable. He should then apply to the Dean of the Graduate School to have a special committee appointed. The special committee, the chairman of which shall be his major professor, will consist of members of the departments in which the applicant elects to do his major and minor work and this committee will supervise his work throughout his period of study.

Not every applicant for the doctor's degree is a candidate. A student is not a candidate for the degree until he has satisfied the language requirements, has passed the qualifying examinations at the University of Kentucky and has been formally admitted by the Graduate School.

Courses of Study

Every applicant for the degree must select one major and at least one and not more than two minor subjects.

The major subject should be one in which he intends to concentrate his efforts; the minor subjects should be closely allied to the major field or be subjects which will be of value in the major work and should be approved by the major department.

The applicant's principal work must be in the major subject. Although no absolute regulations are laid down in respect to the time to be devoted to the major and minor subjects, it may be stated in general that the major subject should represent two-thirds of the student's entire time.

Any regular graduate course may be assigned as part of the applicant's work by his special committee. Only courses numbered above 100 in the University Catalogue are considered as of graduate status. The number and extent of such courses is determined by the special committee.

Residence

A minimum of three collegiate years of resident graduate work, of which at least the last year must be spent at the University of Kentucky, is required for the doctorate. The full time of each of these years must be spent in study. Part-time students and those holding assistantships or engaging in other outside activities will of course be required to take proportionately longer time.

While it is expected that a well-prepared student of good ability may secure the degree upon the completion of three years of study, it should be understood that this time requirement is a minimum and is wholly secondary to the matter of scholarship. Time spent in study, however long; the accumulation of facts, however great in amount; and the completion of advanced courses, however numerous cannot be substituted for independent thinking and original research.

Language Requirements

The applicant must give evidence of having a good reading knowledge of, and of being able to translate at sight, at least two modern foreign languages. This proficiency is determined by examinations conducted by the respective language departments at the University of Kentucky. While ordinarily French and German are acceptable the final choice should be made under the guidance of the student's special committee which will recommend what languages are to count. The language requirements must be satisfied before the applicant can be admitted to the qualifying examination.

Qualifying Examinations

An applicant for the degree of Doctor of Philosophy is required to pass a qualifying examination. This examination should be taken during the second semester of the second year of residence but in no case before the special committee has recommended that the applicant is ready for the examination. The examination shall be both oral and written and shall cover both major and minor subjects. It shall be administered to the applicant by his special com-

mittee and shall be evaluated by that committee. *No applicant may proceed to his final examination until one year of work has been completed in residence after he has passed the qualifying examination.* If the applicant fails to pass the qualifying examination, no re-examination shall be allowed except upon the recommendation of the special committee and the approval of the Graduate Dean.

Dissertation

Each candidate must present a dissertation covering his thesis work. This dissertation must give evidence of the candidate's ability to carry on independent investigation and must be satisfactory in style and composition. It must represent a definite contribution to the knowledge of his subject, must be the result of independent work, must include original research, and must in some way add to or otherwise modify what was previously known on the subject. Two bound typewritten copies of the thesis and two copies of an abstract, the original bound the first carbon unbound, of not less than 1,200 nor more than 3,000 words must be formally presented to the Dean of the Graduate School at least three weeks before the final date on which the Registrar's Office will receive grades of candidates for degrees at the next commencement. *Information regarding this deadline date may be obtained from the Graduate School Office.*

Printing of Dissertation

One hundred printed copies of the dissertation must be presented to the University within one year after the degree is conferred. Not later than one week before the conferring of the degree the candidate must deposit with the Comptroller of the University the sum of \$50.00, this amount to be returned if the printed copies are received within the time specified. The University does not obligate itself to publish the dissertation, but if in the judgment of the Graduate Committee the dissertation or an abstract of same should be published, the University reserves the privilege of so doing.

— Or —

The candidate may have the dissertation printed at his own expense, in which case he must present one hundred copies to the University before the degree is granted. If the candidate has the dissertation printed at his own expense, he will be expected to use good substantial paper and slightly typography. A page four by six inches with outside margin of at least one inch is recommended. The dissertation must have a cover and title page, and the latter, in addition to the title and the name of the author, must bear the following inscription:

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at the University of Kentucky.

If the dissertation is published in a technical journal or other recognized educational publication, the reprints will be accepted if presented with special printed covers and proper title page.

Final Examination

After the acceptance of the dissertation by the special committee and the Dean of the Graduate School, the candidate shall be given a final oral examination by a committee of five members which shall include the head of the major

department or his delegate presiding, one additional professor selected by the major department, one professor selected by each of the minor departments and additional members (to make the total of five) selected by the Dean of the Graduate School. The President of the University and the Dean of the Graduate School are *ex officio* members of all examining committees.

The final examination shall not be held until at least one year has been spent in residence after the student has been accepted as a *candidate* for the degree.

The completion of three years of residence work confers no right upon the student to be so examined.

Recommendation

After the final examination has been passed, the name of the candidate will be presented for recommendation to the Board of Trustees for the degree of Doctor of Philosophy in course.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF EDUCATION

The requirements for the degree of Doctor of Education are exactly the same as those for the degree of Doctor of Philosophy with the following exceptions:

1. No languages are required for the Ed.D. degree.
2. A total of 72 semester hours are required of which at least one-third and not more than one-half must be in departments outside the College of Education.

FELLOWSHIPS AND SCHOLARSHIPS

The University of Kentucky offers the following graduate fellowships and scholarships for the encouragement of research and advanced study:

The Margaret Voorhies Haggin Trust Fellowships and Scholarships in memory of her father, George Voorhies.

Four University fellowships with a stipend of \$500 each.

Fifteen University scholarships with a stipend of \$400 each.

The primary object of these appointments is to stimulate research and not to give pecuniary aid. Scholars and fellows are expected to devote their entire time to graduate work, and no teaching or other departmental work may be required of them. Nor are they permitted to perform such duties for extra pay. The award is paid in ten equal monthly installments and does not include a remission of University fees. The appointments are made for one year only but may be renewed.

These fellowships and scholarships are open to students who hold bachelors' degrees from colleges or universities in good standing. No student should apply for one of these awards who does not cherish a real and earnest desire to do research work.

Forms for making application may be secured from the Dean of the Graduate School and must be submitted not later than March 25.

GRADUATE STUDENTS NOT CANDIDATES FOR DEGREES

Graduate students who are not candidates for advanced degrees are not required to designate major or minor subjects, but may elect their work with a view to the special purposes for which they are in attendance at the University.

Any course of study announced for advanced undergraduates and graduates is open for election by such students under the same conditions as apply to candidates for degrees.

Should a graduate student, who has not arranged for his work with a view to obtaining a degree, subsequently desire to become a candidate for a degree, the number of semester hours he is to receive for work already done will be determined at the time he applies for admission to candidacy for the degree.

No work is given graduate credit unless the student was enrolled in the Graduate School at the time during which the work was taken.

RESEARCH PROGRAM AT THE OAK RIDGE INSTITUTE OF NUCLEAR STUDIES

The University is one of the Sponsoring Universities of the Oak Ridge Institute of Nuclear Studies located at Oak Ridge, Tennessee. Through this cooperative association with the Institute our Graduate Research Program has at its disposal all the facilities of the National Laboratories in Oak Ridge and of the research staffs of these laboratories. When masters' and doctoral candidates have completed their residence work it is possible, by special arrangement, for them to go to Oak Ridge to do their research problems and prepare their theses. In addition, it is possible for the staff members of this university to go to Oak Ridge for varying periods, usually not less than three months, for advanced study in their particular fields. Thus, both staff and students may keep abreast of the most modern and up-to-date developments in atomic and nuclear research that is in progress at the Oak Ridge laboratories.

The students will go to Oak Ridge on Oak Ridge Graduate Fellowships which have varying stipends determined by the number of dependents they have and the level of work that they are doing. Staff members may work in Oak Ridge on stipends commensurate with their present salary and rank.

For further information inquire at the office of the Graduate School or write directly to the Chairman of the University Relations Division of the Oak Ridge Institute of Nuclear Studies, Box 117, Oak Ridge, Tennessee.

GRADUATE FIELDS OF STUDY

The courses offered for graduate work are listed under the following groups:

I. LANGUAGES AND LITERATURES

- Ancient Languages
- English
- German
- Journalism
- Library Science
- Radio Arts
- Romance Languages

II. SOCIAL SCIENCES

- Anthropology
- Business Education (See Education)
- Commerce
- Economics
- Educational Psychology (See Education)
- Farm Economics (See Agriculture)
- History
- History of Education (See Education)
- Law (See Law)
- Markets and Rural Finance (See Agriculture)
- Philosophy
- Philosophy of Education (See Education)
- Political Science
- Psychology (See Biological Sciences)
- Rural Sociology (See Agriculture)
- Social Work
- Sociology

III. BIOLOGICAL SCIENCES

- Agronomy (See Agriculture)
- Anatomy and Physiology
- Animal Industry (See Agriculture)
- Animal Pathology (See Agriculture)
- Anthropology (See Social Sciences)
- Bacteriology
- Botany
- Entomology (See Agriculture)
- Horticulture (See Agriculture)
- Hygiene and Public Health
- Pharmacy (See Physical Sciences)
- Psychology
- Zoology

IV. PHYSICAL SCIENCES

Chemistry
Engineering (See Engineering)
Geography
Geology
Mathematics and Astronomy
Pharmacy
Physics

V. AGRICULTURE

Agricultural Education (See Education)
Agricultural Economics
Agricultural Entomology
Agronomy
Animal Industry
Animal Pathology
Farm Economics
Farm Engineering
Home Economics
Home Economics Education (See Education)
Horticulture
Markets and Rural Finance
Rural Sociology

VI. EDUCATION

Administration
Foundations of Education
Instruction and Placement — Business Education
Curriculum and Instruction
Elementary Education
Music Education
Secondary Education
Vocational Education
Agricultural Education
Distributive Education
Home Economics Education
Industrial Education
Physical Education

VII. ENGINEERING

General Engineering
Civil Engineering
Electrical Engineering
Mechanical Engineering
Metallurgical Engineering
Mining Engineering

VIII. FINE ARTS

Art
Music

IX. LAW

GRADUATE COURSES OF STUDY

Note. Arabic numbers in parentheses indicate the number of semester hours given for each course and the Roman numerals refer to the semester in which the course is offered.

I. LANGUAGES AND LITERATURES

ANCIENT LANGUAGES AND LITERATURES

The Department of Ancient Languages requires, as a prerequisite for the master's degree, attainment in Latin and/or Greek and/or classical civilization equivalent to that required of an undergraduate major in the Department at the University of Kentucky. Students having deficiencies in such an equivalent will plan, in consultation with the Head of the Department, such a curriculum as will make up this deficiency.

The Department offers the master's degree in four fields: (1) Latin, (2) Greek, (3) classical languages and civilization, and (4) the teaching of classical languages.

LATIN

Note: Courses in beginning Latin, Cicero, Vergil, etc., will be offered on the graduate level for students in Greek (or in other departments of the University) who may have need for such courses in their graduate work. The Head of the Department should be consulted about such arrangements.

109a, b – LATIN LITERATURE. Courses in various authors, periods, or types to suit the needs of the class.

Prerequisite: 12 semester hours of Latin (or the equivalent) or permission of instructor.

(3) I, II, S (Skiles)

114a – LATIN COMPOSITION. The writing of Latin prose of moderate difficulty.

Prerequisite: A. L. 3 or permission of instructor.

(1) I, II, S (Skiles)

121 – ROMAN CIVILIZATION. Topics in the political, social, economic, and cultural life of ancient Rome down to Justinian, with special reference to the relation to modern life. Emphasis will be placed on literature, art philosophy, and religion, rather than on political history, and the student may concentrate his reading in any of these fields. *No knowledge of Latin necessary.*

(2) S (Skiles)

150 – THE TEACHING OF LATIN. The place of Latin in general education. The Classical Investigation and subsequent developments in the teaching of Latin. The reading approach to learning Latin. Evaluation of textbooks and other materials. Planning of Latin curricula. Prospective college teachers of classical languages may direct their attention to Latin and Greek in higher education.

(3) I, II, S (Skiles)

202 — THE WORKS OF VERGIL. A careful study of the entire *Aeneid* with emphasis upon the last six books and upon the relation of the *Aeneid* to its sources and to the other works of Vergil.

Prerequisite: A. L. 4 or permission of instructor. (3) I, S (Skiles)

203 — ROMAN COMEDY. Several plays of Plautus and/or Terrence. The history of comedy. The subsequent development of comedy. Introduction to Old Latin.

Prerequisite: A. L. 18 or permission of instructor. (3) II, S (Skiles)

GREEK

Note: Courses in beginning Greek, Greek New Testament, Homer, Plato, Greek Mythology, etc., will be offered on the graduate level for students in Latin (or in other departments of the University) who may have need for such courses in their graduate work. The Head of the Department should be consulted about such arrangements.

156 — GREEK TRAGEDY. Selected plays from Aeschylus, Sophocles, and Euripides. Lectures on Greek tragedy and its effect on the western World. *Prerequisite:* A. L. 53 or 54 or permission of instructor. (3) I (Skiles)

157 — GREEK COMEDY. Selected plays of Aristophanes. Lectures on Greek comedy and its effect on the Western World. *Prerequisite:* A. L. 156 or permission of instructor. (3) II (Skiles)

120 — GREEK CIVILIZATION. Topics in political, social, economic, and cultural life of ancient Greece, with special reference to the relation to modern life. Emphasis will be placed on literature, art, philosophy, and religion, rather than on political history, and the student may concentrate his reading in any of these fields. *No knowledge of Greek necessary.* (2) II (Skiles)

204 — THE GREEK OF THE NEW TESTAMENT. Class and/or individual work to suit the needs of the students. Considerable portions of the New Testament will be read. Individual research in the vocabulary and syntax of the *Koine*, in the text of the New Testament, and in other fields to suit the needs of the student.

Prerequisite: two years of college Greek. (3) I, II, S (Skiles)

CLASSICAL LANGUAGES

122a — CLASSICAL EPIC IN ENGLISH TRANSLATION. *The Iliad*, *The Odyssey*, and *The Aeneid*, with some attention to classical epics of lesser importance. The meaning of these epics to the Greeks and Romans and their effect upon later literature down to modern times. *No knowledge of Greek or Latin required.* (3) I (Skiles)

122b — CLASSICAL DRAMA IN ENGLISH TRANSLATION. Selected tragedies and comedies of both Greek and Roman dramatists. Interpretation of the plays in the light of their meaning to the Greeks and Romans and as background for Western dramatic development down to modern times. Some comparison with modern developments of similar themes and techniques. *No knowledge of Greek or Latin required.* (3) II (Skiles)

151a-h — INDEPENDENT WORK IN ANCIENT LANGUAGES.

Courses to meet the needs of the student will be arranged in various areas of classical philology, e. g., in Greek or Latin writers, in classical civilization, in Greek or Latin grammar and composition, in Greek or Latin linguistic, etc.

Prerequisite: Permission of instructor. (3 ea.) I, II, S (Skiles)

200 — RESEARCH IN THE TEACHING OF CLASSICAL LANGUAGES.

Individual problems in the teaching of Latin and/or Greek will be assigned. Research may be done (with reference to secondary and/or higher education) in methods, in preparation of materials, in the development of curricula, in the place of classical study in education, or in the history of the field.

Prerequisite: A. L. 150 or permission of instructor. (3) I, II, S (Skiles)

DEPARTMENT OF ENGLISH

The Department of English requires, as a prerequisite for the master's degree, attainment in English equivalent to that required of an undergraduate English major at the University of Kentucky. For the master's degree, a minimum of twenty-four semester hours of English and closely allied subjects must be offered, including the introductory seminar. A maximum of six of these twenty-four semester hours may be taken in other subjects, provided these courses have the approval of the Graduate Committee of the Department of English. All candidates for the master's degree in English will be required to attain a reading knowledge of one foreign language before receiving the degree.

Applicants for the doctor's degree are required to complete at least two years of residence work beyond the M.A. The applicant's program must include, among other courses, a minimum of six hours in American literature and a total of six hours in Old English and Linguistics. A knowledge of two foreign languages is required of all applicants. For requirements concerning the qualifying examination, the final examination, and the dissertation, see the discussion of these elsewhere in the bulletin or consult the Department.

101 — CURRENT ENGLISH USAGE AND GRAMMAR. A study of problems in usage, from points of view of descriptive and prescriptive grammar. Designed mainly for prospective and practicing teachers. (3) I (Faust)

102 — INTRODUCTION TO THE STUDY OF THE ENGLISH LANGUAGE. Phonetics, etymology, semantics, syntax and inflection; and the special characteristics (phonetic and lexical) of American English. (3) I (Cutler)

104 — MILTON. A study of all of Milton's poetry and of his more important prose; readings from contemporary thinkers; studies in thought currents of the time and Milton's relation to them. Individual investigations and reports from students. Special attention to Milton's contribution to literature and thought.

Prerequisites: English 1a, b; 3a, b. (3) II (Stroup)

105 — CHAUCER. Extensive reading in the chief works of Chaucer with assigned problems relating to Chaucer and his age.

(3) II (Cutler and Moore)

106a — ENGLISH ROMANTIC POETRY. The philosophical, critical, social, and political backgrounds or romanticism are examined; attention is given to the growth of romanticism in the eighteenth century; but the emphasis is on the major poets of the early nineteenth century: Wordsworth, Coleridge, Byron, Shelley, and Keats. (3) I (Ward)

106b — ENGLISH ROMANTIC PROSE. A continuation of English 106a. The novel, the essay, literary criticism, periodical literature, and the political treatises of the day are studied. Particular attention is given to prose writers like Lamb, Hazlitt, De Quincey, Scott, and Jane Austen, and to the critical prose of poets like Wordsworth, Coleridge, and Shelley. (3) II (Ward)

107a — VICTORIAN POETS. An extensive study of the ideas of the chief poets of the Victorian era, with special emphasis on the works of Tennyson, Browning, Arnold, Swinburne, and Rossetti. (3) I (Brady)

107b — VICTORIAN PROSE. A study of Carlyle, Ruskin, Newman, Spencer, Arnold, Huxley, and related writers of the period in the field of prose. Special emphasis is placed on Carlyle's *Sartor Resartus*. (3) II (Shine)

108a — PRINCIPLES OF LITERARY CRITICISM. A course designed to show criticism as a growth and development in an historical survey and to give a corpus of opinion about literature. (3) I (Farquhar)

108b — PRINCIPLES OF LITERARY CRITICISM. A continuation of 108a, which is not prerequisite although desirable (3) II (Farquhar)

109 — PRE-SHAKESPEARIAN DRAMA. A course in English dramatic origins; a study of the works of Lyly, Kyd, Greene, Peele, Jonson, and Marlowe. (3) I (Graduate Staff)

110a — SHAKESPEARE: THE COMEDIES. Shakespeare's comedies will be studied in detail. (3) I (Staff)

110b — SHAKESPEARE: THE TRAGEDIES. A continuation of English 110a, which is not prerequisite, although desirable. Special attention to the great tragedies. (3) II (Staff)

111a — THE EIGHTEENTH CENTURY NOVEL. A study of the novel from its beginning in English literature to the advent of Scott. (3) I (Cooke)

111b — THE VICTORIAN NOVEL IN ENGLAND. A continuation of English 111a, although the latter is not prerequisite. The course aims to acquaint the student with the development of the novel from Dickens through Gissing. (3) II (Knight)

116 — THE CONTEMPORARY DRAMA. A course designed to show the development and tendencies in Continental, British, and American dramatic literature, 1850 to date. (3) II (Staff)

117 — WORKSHOP IN IMAGINATIVE WRITING. A continuation and enlargement of 2b, The Short Story. Chief attention again will be directed to the short story, but time also will be given to non-fiction and to the novel. Students who have taken 2b will find it helpful, although 2b is not an absolute prerequisite for the student who has had writing experience which, in the opinion of the instructor, is the equivalent of that gained in 2b. *Prerequisite: permission of instructor.* (2) I, II (Guthrie)

123a — AMERICAN LITERATURE BEFORE 1830. A survey intended to show the development of American life, thought, and letters up to the Transcendental movement. (3) I (Knight and Spivey)

123b — AMERICAN LITERATURE AFTER 1830. A continuation of 123a, which is not prerequisite. Beginning with the Transcendentalists, it studies the triumphant years of American romanticism, with especial attention to Emerson, Thoreau, Hawthorne, Melville, Poe, and Whitman. (3) I (Knight and Spivey)

124a — ENGLISH LITERATURE: 1500-1600. A study of literature of the Elizabethan period exclusive of the drama. Foreign sources of the English Renaissance. Major English writers from 1500 to 1600, such as More, Ascham, Wyatt, Sidney, Spencer, Raleigh, and Marlowe. (3) I (Stroup)

124b — ENGLISH LITERATURE: 1600-1660. A continuation of 124a. Excluding the drama, this course will cover selected writings of the major literary figures of the period, such as Bacon, Donne, Ben Jonson, George Herbert, Izaak Walton, Herick, Sir Thomas Browne, Vaughan, Traherne, and Milton. Intensive readings of carefully selected writings for discussion; extensive readings for reports and papers. Emphasis will fall upon the literary texts themselves, though due attention will be given to thought movements and literary history. (3) II (Stroup)

127a — LITERATURE OF THE BIBLE. A literary study of the Bible. The purpose of the course is to develop an appreciation of literature generally because of the demand that literature identify itself with the highest thought and feeling. (3) I (Farquhar)

127b — LITERATURE OF THE BIBLE. A continuation of English 127a, which it not prerequisite, although desirable. (3) II (Farquhar)

130a — COMPARATIVE LITERATURE. Extensive reading of literary masterpieces from Homer to the present day. A study of traditions of civilization as reflected in literary movements. The readings are assigned in English translations, but a reading knowledge of at least one foreign language is desirable. (3) I (Brady)

130b — COMPARATIVE LITERATURE. A continuation of English 130a, which is not prerequisite, although desirable. (3) II (Brady)

131a-d — INDEPENDENT WORK. A course for advanced students of exceptional scholastic standing. Each student pursues a course independently, under the guidance of one member of the staff. The student writes a paper embodying the results of his study and submits to an examination by the staff of the department. (3) I, II (Staff)

133 — THE DEVELOPMENT OF AMERICAN REALISM. Traces the progress of American realism from Yankee and pioneer humorists through the local color school, the leading novelists of the eighties and nineties, their contemporaries in drama and poetry, to the writers of today. (3) II (Knight)

137 — STAGE PRODUCTIONS IN SCHOOL AND COMMUNITY. This course is designed to meet the particular needs of teachers and community theatre workers. It will consider the problems of staging under circumscribed conditions and will discuss minimum essentials of play production and means of constructing or supplying these needs. Individual student problems will be considered in discussing practice of staging. (3) I, II (Briggs)

138 — ADVANCED ORAL INTERPRETATION.

Prerequisite: English 38a or permission of instructor.

(3) II (Sterrett)

143 — EDGAR ALLAN POE. A comprehensive study of Poe's works, poetry and prose.

(3) II (Farquhar and Spivey)

145 — ELIZABETHAN DRAMA, EXCLUSIVE OF SHAKESPEARE. A survey of English drama during the period of Elizabeth. Special study of foreign drama and its influence upon the Elizabethan material.

(3) I (Stroup)

146a — DISCUSSION. The essentials of discussion, with emphasis upon the thinking process as it operates in group situations. Participation in the various forms of discussion.

(3) I (Blyton)

146b — ADVANCED DISCUSSION. An intensive study of discussion as democracy in action. Ample time devoted to practice discussions.

(3) I (Blyton)

147 — AGE OF JOHNSON. From 1740 to 1789. Johnson and his circle: Burke, Goldsmith, Gray, Walpole, Cowper. The Pre-Romantic movement.

(3) I (Cooke)

148 — A GENERAL INTRODUCTION TO FOLKLORE. An introduction — on a world-wide scope — to the types of folklore: the folktale in its various forms, the legend, the anecdote, the ballad, the riddle, folk beliefs, folk games, etc. Emphasis upon folklore as a cultural phenomenon in its own right and upon its relations to literary types. The development of the science of folklore.

(3) I (Jansen)

149 — AMERICAN FOLKLORE. A study of the major materials in American folklore: the lore of professional, regional, national, racial groups. The use of this material in other forms. Experience in actual collecting and in the cataloging of materials. English 148 is not a prerequisite.

(3) II (Jansen)

150 — WORKSHOP IN SPEECH EDUCATION. Designed for advanced students, especially teachers and prospective teachers. Individual and group research projects conducted in regular consultation with the instructor. Particular emphasis is placed upon problems pertaining to the teaching of speech.

(6) II (Blyton)

152 — THE AGE OF POPE. Addison and Steele, Swift, Pope, Defoe, and other contemporary figures.

(3) II (Cooke)

153 — THE DRAMA OF THE RESTORATION AND EIGHTEENTH CENTURY. A study of the dramatic types that arose between the closing of the theaters in 1642 and the death of Sheridan.

(3) I (Cooke)

155a — CONTEMPORARY AMERICAN POETRY. An examination of the forces which have developed to create modern poetry in England and America since 1900. The course is an historical study of the movements and currents in their origins and ideas, and a study of literary and esthetic appreciation of form, matter, and style. Collateral reading.

(3) I (Farquhar)

155b — CONTEMPORARY BRITISH POETRY. A continuation of 155a, which is not prerequisite, although desirable.

(3) II (Farquhar)

157 – TEACHING OF SPEECH AND ORAL ENGLISH. Discussions dealing with practical problems in teaching. Intended for teachers and prospective teachers. (3) II (Blyton and Sterrett)

158 – ADVANCED ARGUMENTATION AND DEBATE. The function of argumentation and debate in a democracy, plus a much more detailed and critical examination of the logic of argument than is covered in English 11a. (3) II (Blyton)

159 – PERSUASION. The principles and methods of persuasion. Special attention to speech as an instrument for gaining acceptance. This course will be of particular benefit to teachers, lawyers, business majors, and other persons whose work is concerned with motivating human conduct. (3) I (Blyton)

160 – THEORY AND TECHNIQUE OF ACTING. Theory of acting applied to individual problems and groups. Development of skill, effectiveness, and grace in the use of the body. Attention to establishing mood, reactions between characters, suspense, three voice modulations, pause and other modes of emphasis, projecting voice and characterization. This course is designed to be helpful to public speakers, actors, and teachers. (3) I (Briggs)

161 – THEORY AND TECHNIQUE OF DIRECTING. Theory of plotting and interpreting a play for directors. Study of movement, interpretation of lines, creation of atmosphere, use of stage areas, use of levels, methods of achieving a climax, handling of groups, planning of mob scenes. Each student will have opportunities to direct plays under supervision. This course is designed especially for teachers who will have to direct plays as a part of their regular work. (3) II (Briggs)

162 – THEORY AND TECHNIC OF THEATRE PRODUCTION. Intensive study of the practical problems of play production. Application of modern esthetic principles and theories of the theatre. Practice and demonstration of non-professional theatre producing. Attention to coordination of the playwright, designer, technical director, electrician, stage manager, the actor, etc. (3) II (Graduate Staff)

163 – SCENIC DESIGN. This course offers a study in set design and in the consideration of form, line, and color as applied to the stage. Practical work will be given in the building of model sets and in the application of these models to the major productions. (3) I, II (Brockett)

164 – SPEECH COMPOSITION. A study of speech structure and oral style through a survey of the major theories of speech composition. The analysis of model contemporary speeches. Preparation and discussion of speech manuscript. (3) I (Sterrett)

172 – WRITING THE ONE-ACT PLAY. This course is designed for those students interested in creative drama. The completion of at least one one-act play is required during the semester. (3) I (Robinson)

174 – WRITING THE FULL-LENGTH PLAY. (3) II (Robinson)

203 – OLD ENGLISH. A study of Old English language and literature. (3) I (Cutler and Moore)

204 — MIDDLE ENGLISH AND MODERN ENGLISH. The transition from Old to Middle English; the major ME dialects; reading in prose and poetry. The transition to Modern English; phonetic changes, sources of the vocabulary, rhetoricians and grammarians, the English dictionaries, historical grammars. (3) I (Cutler and Moore)

205 — SURVEY OF MIDDLE ENGLISH LITERATURE. Romance, drama, lyrics, and ballads. (3) II (Cutler and Moore)

206a-d — SEMINAR: STUDIES IN THE ENGLISH ROMANTIC PERIOD. (3 ea.) I, II (Ward)

210 — SEMINAR: BIBLIOGRAPHICAL STUDIES. This course is required of all candidates for the M.A. degree. It should be taken at the beginning of graduate work. (3) I (Brady)

212a-d — SEMINAR: STUDIES IN MEDIEVAL LITERATURE. (3) II (Cutler and Moore)

213a-d — SEMINAR: STUDIES IN RESTORATION AND EIGHTEENTH CENTURY LITERATURE. Johnson and his circle, Swift, the Romantic Revolt, the foreign relations of English literature in the eighteenth century, or the theory and practice of Neoclassicism will be chosen for extensive investigation according to the needs of the students in the group. (3) II (Cooke)

214a-d — SEMINAR: STUDIES IN VICTORIAN LITERATURE. Intensive studies in the social and literary significance of Arnold, Browning, Carlyle, and Ruskin. (3) II (Brady and Shine)

215a-d — SEMINAR: STUDIES IN LITERARY CRITICISM. These seminars seek primarily to present the problems of criticism, structural and historical. Critical backgrounds will be stressed so that critical studies in English literature may be made. (3) I (Graduate Staff)

216a-d — SEMINAR: STUDIES IN AMERICAN LITERATURE BEFORE 1900. (3) I, II (Spivey and Knight)

217a-d — SEMINAR: STUDIES IN CONTEMPORARY AMERICAN LITERATURE. (3) I, II (Spivey and Knight)

224a-d — SEMINAR: STUDIES IN ENGLISH LITERATURE FROM 1500 TO 1660. A preliminary survey of the literary and cultural trends of the period is followed by directed research based upon the work of one writer, one group of writers, or one literary type. One long paper and at least one short one are required; oral reports are made on special problems and one such long report is given involving the work of the extensive paper. (3) II (Stroup)

GERMAN

The Department of German requires as a prerequisite for the masters degree, attainment in German equivalent to that required for a German major. The number of hours of German required for the M.A. degree varies depending upon the advanced courses the student may be asked to take and/or permitted to take in related departments. The courses listed below will be given as scheduled and any additional semester when requested by a sufficient number of students.

105a-f — INDEPENDENT WORK IN GERMAN. This course is designed for students who wish to do advanced work in German on any subject. It is not limited to majors in the department.

Prerequisite: 6 semesters of German.

(3) I, II, S (Staff)

106a — ADVANCED SCIENTIFIC READING. This course is designed primarily for students of the Physical and Biological Sciences. Reading is done in recent German scientific journals and books, the material being selected in line with the student's special interest.

Prerequisite: German 20b or 21b or permission of Department.

(3) I, II, S (Staff)

106b — ADVANCED SCIENTIFIC READING. Continuation of 106a.

Prerequisite: 106a or permission of Department.

(3) I, II, S (Staff)

PROSEMINARS IN THE 18th, 19th, AND 20th CENTURY GERMAN LITERATURE. A balanced selection of works from one representative author of each century will be studied in each course, and written reports will be assigned on various subjects related to his writing.

Prerequisite for any Proseminar Course:
6 semesters of German.

(Staff)

112 — PROSEMINAR IN KLEIST. (2) I

113 — PROSEMINAR IN HAUPTMAN. (2) II

114 — PROSEMINAR IN SCHILLER. (2) I

115 — PROSEMINAR IN GRILLPARZER. (2) II

116 — PROSEMINAR IN THOMAS MANN. (2) I

117 — PROSEMINAR IN LESSING. (2) II

118 — PROSEMINAR IN HEBBELL. (2) I

119 — PROSEMINAR IN SUDERMANN. (2) II

143a-b. — LIFE AND WORKS OF GOETHE. This course follows the unfolding of Goethe's genius from his first lyrics through the second part of Faust. His principal literary works will be read and special attention devoted to autobiographical material, letters, and diaries.

Prerequisite: 6 semesters of German.

(3) I, II, S (Hegeman)

150 — ORIGIN AND DEVELOPMENT OF THE GERMAN LANGUAGE. This introductory course in Germanic Philology acquaints the student with the position of German in the Indo-European language group and traces the various stages in the development of the German language up to the present. Special emphasis is given to the relationship of German and English words.

Prerequisite: 6 semesters of German.

(3) I, II, S (Staff)

151 — INTRODUCTION TO MIDDLE HIGH GERMAN. This is essentially a literary course with only a necessary minimum of Middle High German grammar. Selections will be read from both the epic and lyric poetry of the period and reports will be given on assigned topics.

Prerequisite: 6 semesters of German.

(3) I, II, S (Hegeman)

152 – ADVANCED GERMAN CONVERSATION AND COMPOSITION. This course is primarily one for German majors, particularly those planning to teach German. It will involve intensive practice in the writing of German prose, together with some review of German grammar.

Prerequisite: 6 semesters of German.

(3) I, II, S (Staff)

204a – GERMAN DRAMA OF THE 19th CENTURY. This course is a study of the German Drama from Schiller's "Die Braut von Messina" to 1870.

Prerequisite: 6 semesters of German.

(3) I (Whitaker)

204b – THE GERMAN NOVELLE. This course traces the origin and development of the German Novelle from Goethe to Thomas Mann.

Prerequisite: German 204a or permission of Department.

(3) II (Whitaker)

205a, b – GERMAN LITERATURE OF THE 20th CENTURY. Extensive readings, discussions, and comprehensive reports on the leading literary minds and movements of this century.

Prerequisite: 6 semesters of German.

(3) I, II, S (Bigge)

206 – THE AGE OF GOETHE. A seminar devoted to the investigation of one or more topics in the literature and social development of Germany during the period 1750 to 1825.

Prerequisite: 6 semesters of German.

(3) I, II (Hegeman)

JOURNALISM

The following courses are open to properly qualified graduate students who may receive credit for them. No major programs in Journalism are offered for advanced degrees at present.

100a – NEWS REPORTING. Instruction and practice in news gathering, news avaluation, and news writing.

Prerequisite: Journalism 22.

(3) I, II (McCauley)

100b – NEWS REPORTING. A continuation of Journalism 100a with emphasis on special fields of information.

Prerequisite: Journalism 100a.

(3) I, II, S (McCauley)

101 – COPYREADING AND EDITING. Instruction and practice in newspaper deskwork. Preparation of local, state, telegraph, and radio news and features; picture editing, and page make-up. Laboratory 6 hours.

Prerequisite: Journalism 100a.

(3) I, II (McCauley)

102 – COMMUNITY JOURNALISM. A study of the problems which confront the community weekly and the small city daily.

(3) I, S (Portmann)

103 – NEWSPAPER ADMINISTRATION. A study of the business, circulation, advertising, and accounting divisions of the newspaper with special emphasis on the community newspapers.

(3) II (Portmann)

105 – LAW OF THE PRESS. A study of the special laws of libel, copyright, and regulatory provisions that pertain to the press.

(2) II, S (Plummer)

106 — INFLUENCE OF THE NEWSPAPER. A course devoted to the examination of criticism of the modern press and an evaluation of the influence of the press in the twentieth century. Lectures and readings directed toward the evolution of principles for the guidance of members of the news, editorial, and business staffs of newspapers.

Prerequisite: permission of Department.

(3) I, II, S (Moore)

107 — EDITORIAL WRITING. A study of editorials, editorial columns, and editorial pages. Publication of copy encouraged.

Prerequisite: Journalism 22.

(2) I, II (McCauley)

108 — HISTORY OF JOURNALISM. A study of the rise and development of American journalism and newspapers.

Prerequisite: permission of Department.

(3) II (Portmann)

109 — TYPOGRAPHY. Instruction and practice in typographic composition. Use of type faces in news editing. Study of typography in the make-up of American newspapers. Laboratory, four hours.

(2) I, II (Portmann)

110 — SUPERVISION OF HIGH SCHOOL PUBLICATIONS. A study of the problems that confront the adviser of the high school newspaper or magazine. Open to advisers or prospective advisers with consent of the instructor.

(3) S (Portmann)

111 — VERBAL CRITICISM. A study of words and their synonyms with reference to developing accuracy in use of the English language in journalistic work.

(3) I, II, S (McCauley)

112 — CRITICAL WRITING FOR THE PRESS. The function of criticism in journalism. Reviewing of motion pictures, plays, concerts, and books for newspapers with emphasis upon student work in Kentucky newspapers.

(3) I, II, S (McLaughlin)

114 — NEWSPAPER ADVERTISING AND PROMOTION. Relations of newspapers with retail advertisers; newspaper advertising department organization; advertising rate structures; classified advertising; legal advertising; organization and development of the promotion department.

(3) I, II, S (Portmann)

115 — ADVERTISING TYPOGRAPHY AND LAYOUT. A study of the principles of typographic families and illustrations and decorations that pertain to layout in modern advertising. Practical work with merchants included in the latter part of the course. Lecture, 2 hours; laboratory, 4 hours.

(3) II (Portmann)

118 — PUBLICITY. Lectures and practice dealing with the aims and methods of writing news and special articles for public relations programs of business, schools, colleges, libraries, and of the social service organizations.

(3) II, S (Plummer)

120 — SEMINAR IN PUBLIC OPINION. A detailed examination of techniques developed and used by the press in influencing public opinion. Specific cases studied. Latter part of course devoted to the preparation of newspaper campaigns dealing with current problems of society.

Prerequisite: permission of Department.

(3) (Moore and Plummer)

123 — FEATURE WRITING. Instruction and practice in writing features. Lectures, readings, and reports directed toward discovering, gathering, organizing, writing, and marketing feature articles for newspaper supplements, trade journals, and other periodicals.

Prerequisite: permission of Department. (3) I, II (Plummer and Moore)

125 — MAGAZINE ARTICLE WRITING. Lectures, personal conferences, and practice in writing and submitting material for publication in magazines; study of the markets for this material; free-lance article writing.

Prerequisite: permission of Department. (3) II, S (Moore)

127 — REPORTING PUBLIC AFFAIRS. Instruction and practice in reporting the news originating in courts and other public institutions.

Prerequisite: Journalism 100b and permission of Department.

(3) II (Plummer)

150 — RADIO NEWS SCRIPTS. Instruction and practice in writing news and feature material for radio presentation.

Prerequisite: Journalism 22.

(2) I, II (Moore)

LIBRARY SCIENCE

The University provides professional education for library work through the Department of Library Science.

Professional courses leading to the master's degree are designed primarily for majors in library science but non-majors may be admitted on approval of the Head of the Department. Students in the College of Education who are working for the M.A. or M.S. in Education may elect courses in library science to fulfill the Southern Association requirements for teacher-librarians. Those interested should consult with the Department for guidance in the selection of all such courses.

101a-d — INDEPENDENT WORK. Conferences, assigned readings, reports, etc.

Prerequisites: L. S. 129, 133a,

(1 each) I, II, S (Staff)

145, 152, and either 110 or 121.

110 — THE LIBRARY IN THE SCHOOL. A study of the school library as a functioning organization. Topics included: school library objectives; planning and equipment; personnel problems; standards; budgets and finance; circulation records and procedures; attendance and other records; instruction in the use of the library; school library activities; school library and other community agencies.

(3) I, S (Wofford)

121 — INTRODUCTION TO LIBRARY WORK. An orientation course designed to give students a general understanding of libraries and library work. Topics included: survey of libraries in the United States; types of positions in libraries; training for library work; qualifications expected of the trained librarian; library work as a profession; functions of libraries; general principles of library administration.

(3) I, S (Martin)

127a — BOOKS AND RELATED MATERIALS FOR CHILDREN AND YOUNG PEOPLE. Designed primarily for school librarians but open to any students preparing to work with children and young people. Consideration of many types of books and related materials for various ages and reading abilities and their use with young readers. Emphasis on library materials to supplement the curriculum and encourage recreational reading.

(3) I, S (Wofford)

127b – BOOKS AND RELATED MATERIALS FOR CHILDREN AND YOUNG PEOPLE. A continuation of 127a.

Prerequisite: L. S. 127a.

(3) II, S (Wofford)

129 – CATALOGING AND CLASSIFICATION. A study of the fundamental principles and methods of classification and cataloging books and related materials. Emphasis on functions with sufficient practice to enable students to handle cataloging in the average library situation. Dewey decimal classification and simplified cataloging emphasized with use of printed cards and other aids.

(3) I, S

133a – REFERENCE AND BIBLIOGRAPHY. A study of the essential reference works, including dictionaries, encyclopedias, atlases, yearbooks, and periodical indexes; of the more important subject and trade bibliographies; vertical file materials; and of the standards and methods by which such material is selected, organized, and efficiently used. Special attention is paid to the reference book collection in the high school library.

(3) I, S (Poste)

133b – REFERENCE AND BIBLIOGRAPHY. A continuation of L. S. 133a. Emphasis is placed on reference books in subject fields and on the national and subject bibliographies.

Prerequisite: L. S. 133a.

(2) II, S (Poste)

139 – LIBRARY PRACTICE. Observation and supervised practice in a school library. This course fulfills a requirement of the Southern Association for school librarians.

(3) II, S (Roser)

145 – ORGANIZATION OF LIBRARY MATERIALS. A course designed to give the beginning librarian practical instruction in the acquisition and organization of library materials. Among the topics included are ordering, accessioning, preparation of books and other materials for library use, mending, binding procedures, inventory, and other processes concerned with the physical maintenance of the collection. The use of library statistics in making reports is investigated.

(3) I, S (Wofford)

152 – BOOK SELECTION. A general study of book selection principles and methods, with emphasis on printed materials as they interpret modern problems. Topics and activities included: principles and standards for the selection of books, periodicals and pamphlets, book publishing, series and editions; extensive reading and evaluation of types of books in philosophy, religion, sociology, science, the fine arts, history and travel; critical examination of aids to book selection, including book reviewing periodicals.

(3) I, S (Martin)

212 – THE PUBLIC LIBRARY. A study of the public library as a functioning institution. Topics included: organization and administration of public library service; selection of books for public libraries; registration and circulation records; analysis of public library services and activities; trends in public library service; the library in relation to other community organizations. The course will include case studies of specific libraries.

(2) I, II, S (Martin)

214 – THE COLLEGE AND UNIVERSITY LIBRARY. A study of the college and university library as a functioning institution. Topics included: higher education in America; functions of the library in higher education; library standards; organization and administration of libraries in higher education.

tional institutions; the library staff; finances; book collections; buildings; records and reports; circulation problems and procedures; analysis of library services and activities; trends in college and university library service; library relations with faculty, students, and administration. The course will include case studies of specific libraries.

(2) I, II, S (Poste)

227 — READING FOR YOUNG PEOPLE. This course will consider reading needs and interests of young people together with current studies in the field. Methods of reading guidance with various types of readers and employing all kinds of media included. New trends in books and related materials, as well as problems in young people's reading, will be considered. Designed for librarians working with young people who wish to further their knowledge in the field.

Prerequisites: L. S. 127, *b*, or equivalent.

(2) II, S (Wofford)

229 — ADVANCED CATALOGING AND CLASSIFICATION. Expansion of the principles and methods of classification and cataloging books and related materials. Attention given to more advanced problems in cataloging, and types of materials found in larger libraries, especially college and university. Consideration of use of Library of Congress classification and forms for cataloging.

Prerequisite: L. S. 129 or equivalent.

(4) II, S

232 — LIBRARY WORK WITH CHILDREN. A study of the origin and present status of library work with children in school and public libraries. Standard books for children in the major areas of interest are presented through story-telling, appreciation hours, and the study of special problems in bringing books and children together. Administration of children's libraries and consideration of the historic development of children's work in America, are included.

(4) I, S (Martin)

233 — SUBJECT BIBLIOGRAPHY. A comprehensive study of basic reference materials in the humanities, social sciences, and natural sciences. This course emphasizes reference service in research libraries.

Prerequisites: L. S. 133a, *b*, or equivalent.

(3) II, S (Poste)

235 — GOVERNMENT PUBLICATIONS. A study of the problems of acquisition, preparation and use of United States federal, state, and local government publications. Some consideration is given to documents of the United Nations.

Prerequisite: L. S. 133a, *b*, or equivalent.

(2) II (Poste)

242 — HISTORY OF BOOKS. This course is designed to present the background of modern library service. It considers the records of early man, invention of the alphabet, early writing materials, manuscript books, the invention of printing, and book production in modern times.

(2) II (Martin)

250 — ADULT READING GUIDANCE. Survey of the significant published studies of adult reading, as a guide to book selection through knowledge of adult needs and interests commonly satisfied through printed materials. Adaptation of survey techniques to aid the librarian without research specialists at his disposal, will also be emphasized.

(3) II, S (Martin)

252 — ADVANCED BOOK SELECTION. Emphasis on the more imaginative and creative forms of literature, especially the place of fiction in the

modern public library. Drama, poetry, and periodicals will also be considered, and presented through reviews, oral and written, and through preparation of book lists and exhibits.

Prerequisite: L. S. 152 or equivalent.

(4) II, S (Martin)

254 – SEMINAR. Discussions and reports on current problems and trends in library service. Consideration of methods of investigating library problems. Assistance in the preparation of the thesis. (2) II, S (Staff)

RADIO ARTS

While no advanced degrees are offered at present with a major in Radio Arts, graduate students may find the following courses of value if they plan to enter any of the phases of radio work or if a knowledge of radio procedures would be useful in any other occupational activity.

Departmental facilities include an FM transmitter, three studios, two announce booths, three studio control rooms, library, record room, sound effects room. Also daily broadcasts are scheduled over nearby commercial stations.

101 – RADIO REGULATIONS. Two recitation or lecture periods per week, devoted to an intensive study of Parts 2, 3, and 4 of the Rules and Regulations of the Federal Communications Commission, including various application procedures; the music licensing regulations of ASCAP, SESAC, and BMI, and programming practices; censorship through FCC licensing practices; libel and slander; copyrights as applied to broadcasting. (2) (Sulzer)

102 – ADVANCED RADIO ANNOUNCING. One recitation or lecture period and two hours laboratory per week. The study of techniques and theory pertaining to specialized radio announcing, news commentating, public events, man-on-the-street, the interview, round-table participation and moderation, public forum on the radio, master of ceremonies, concert announcing and intermission comment.

Prerequisite: Radio Arts 2a.

(2)

105a – RADIO SCRIPT WRITING. One recitation and two hours laboratory per week. Practice in script-writing in the various short forms; music continuities, commercials, audience participation programs, interviews, talks, with special emphasis on the writing tools of radio. (2)

105b – RADIO SCRIPT WRITING. One recitation and two hours laboratory per week. A continuation of 105a. Practice in writing the larger forms: original dramas, adaptations, variety programs, serials, children's programs, public service programs. Analysis and evaluation of the various forms; consideration of writing for television.

Prerequisite: Radio Arts 105a.

(2)

106a – RADIO PRODUCTION. One recitation and two hours laboratory per week. The fundamentals of radio production, including program planning, casting, rehearsals. Practice in production. (2) (Sulzer)

106b – RADIO PRODUCTION. Conferences and laboratory three hours per week. A continuation of 106a. Advanced practice in radio production involving research on assigned projects for radio presentation in educational broadcasts.

Prerequisites: Radio Arts 105a, b, and 106a.

(2) (Sulzer)

110 – PROSEMINAR. One recitation per week. Lectures and outside readings devoted to radio and its relation to other communications media from the standpoints of structure, function, process, basic tools of research, control, content, radio as a channel, the audience, and effect.
Prerequisite: permission of instructor.

(1) Sulzer

ROMANCE LANGUAGES AND LITERATURES

The Department of Romance Languages requires, as a prerequisite for the master's degree, attainment in French or Spanish equivalent to that required of an undergraduate major in either French or Spanish at the University of Kentucky.

The Department of Romance Languages offers the doctor's degree in the following fields: Linguistics, French Literature from the Sixteenth Century to Twentieth, Spanish Literature from the Golden Age to the Twentieth Century, and in Modern Spanish American Literature.

FRENCH

103a, b – ADVANCED PHONETICS. A study of the phonetics of Romance Languages with special attention to French. A course to prepare teachers of phonetics.
(3) I, II, or S (Schick)

109a – FRENCH LITERATURE OF THE NINETEENTH CENTURY. A study of French Romanticism. Lectures and reading.
(3) I, II, S (Ryland)

109b – FRENCH LITERATURE OF THE NINETEENTH CENTURY. A study of Realism and Naturalism in France. Lectures and reading.
(3) I, II, S (Ryland)

110a – FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. A study of the literature of this period, not including Moliere, Corneille and Racine.
(3) I, II, S (Eilertsen)

110b – FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. The plays of Moliere, Corneille and Racine.
(3) I, II, S (Eilertsen)

113a, b – ADVANCED FRENCH GRAMMAR. A study of the grammar and syntax of the French language; an introduction to French etymology.
(4) I, II, S (Ryland)

114a-h – INDEPENDENT WORK IN ROMANCE LANGUAGES. Independent work designed to meet individual needs of students, as verified by consultation with the staff.
(3) I, II, S (Staff)

115a, b – FRENCH LITERATURE OF THE EIGHTEENTH CENTURY. A survey of the literature of the period. Lectures and reading.
(3) I, II, S (Walker)

116a, b – FRENCH LITERATURE OF THE TWENTIETH CENTURY. A study of recent writers. Lectures and selected readings.
(3) I, II, S (Horsfield)

122a, b – ADVANCED FRENCH CONVERSATION. Studies in diction, poetry reading and elocution.
(2) I, II, S (Ryland)

201a, b – FRENCH LITERATURE OF THE RENAISSANCE. A study of the works of Villon, Marot, Rabelais, Calvin, Montaigne, Ronsard and others. (3) I, II, S (Ryland)

202a, b – OLD FRENCH. A study of the grammar and syntax of Old French. Readings from the Chanson de Roland. (3) I, II, S (Schick)

204a, b – ROMANCE PHILOLOGY. A study of some of the elements of Vulgar Latin. The phonology, etymology and historical grammar of the Romance Languages; comparative Romance Philology. (3) I, II, S (Schick)

205a, b – SEMINAR IN FRENCH LITERATURE. (3) I, II, S (Staff)

SPANISH

102a, b – ADVANCED SPANISH GRAMMAR AND COMPOSITION. A study of the grammar and syntax of the Spanish language. (3) I, II, S (Server)

104a, b – SPANISH LITERATURE OF THE SEVENTEENTH CENTURY. A study of the novel, drama, poetry of the Golden Age. Lectures and reading. (3) I, II, S (Hernandez)

106a, b – SPANISH LITERATURE OF THE TWENTIETH CENTURY. A study of recent authors. Lectures and readings. (3) I, II, S (Server)

108a, b – SPANISH AMERICAN LITERATURE. A study of the representative literature of the Spanish American countries. (3) I, II, S (Server)

112a – SPANISH LITERATURE OF THE NINETEENTH CENTURY. A study of Romanticism in Spanish Literature. (3) I, II, S (Server)

112b – SPANISH LITERATURE OF THE NINETEENTH CENTURY. Latter half of century; the Realistic novel; neo-Romanticism. (3) I, II, S (Server)

203a – OLD SPANISH. A study of the vocabulary and grammar of Old Spanish contrasting and comparing with Modern Spanish. (3) I or II (Server)

203b – OLD SPANISH. Reading in texts of Old Spanish. (3) II or S (Server)

206a, b – SEMINAR IN SPANISH LITERATURE. (3) I, II, S (Staff)

II. SOCIAL SCIENCES

ANTHROPOLOGY

103a-d – INDEPENDENT WORK IN ANTHROPOLOGY. Individual research problems in archaeology, ethnology, or physical anthropology. (Offered every year.) (3) (Staff)

107 – ETHNOLOGY OF THE NEW WORLD. Cultures and physical types of the American Indians during and after White settlement. (Northwestern North America is not included.) Representative Indian tribes from each major culture area will be studied. (3) II (Essene)

110a-b – FIELD METHODS IN ANTHROPOLOGY. An advanced course in excavating and reporting of archeological sites, and in cataloguing and preparing specimens for analysis in the museum.
Prerequisites: Anthropology 1, 2, 10, 107, and 115. (3) S (Staff)

111 – ARCHAEOLOGICAL THEORY AND METHODS. The concepts and aims of archaeology will be considered, its history as a scientific discipline and its present role in the social sciences. Attention will be given to basic principles of field work and laboratory study, and to recent advances in special techniques. Lectures, selected readings, and preparation of term paper.
Prerequisites: Anthropology 2, 114, 115, or 116. (3) II (Woodbury)

114 – PREHISTORIC MESO-AMERICA AND PERU. An intensive study of the native American civilizations: their origins, development and achievements. Lectures and reading in archaeological and historical sources. (3) I (Woodbury)

115 – NORTH AMERICAN ARCHEOLOGY. A study of the origin and growth of prehistoric American Indian cultures north of Mexico as revealed by archeological data. Lectures and selected readings for paper preparations. (3) II (Woodbury)

116 – BEGINNINGS OF CIVILIZATION. Prehistory of the Indus Valley, Southern Turkestan, Iran, Asia Minor, and Egypt. In this area civilization was born. Here is found the earliest evidences of agriculture, pastoralism, pottery, smelting, writing, law codes, irrigation, astronomy, kingship, building of stone, priesthood, temples, coined money, and many other important inventions. The growth and spread of each major culture center will be considered. Lecture 3 hours.

Prerequisite: one course in Anthropology. (3) I (Woodbury)

117 – DIFFUSION OF CIVILIZATION. Prehistory of the Far East, Europe, and Negro Africa and ethnology, of some of the primitive tribes still surviving in these areas. Near Eastern cultural influences combined with local development produced different results in these three areas, but a similar pattern of change may be traced. Lecture 3 hours.

Prerequisite: Anthropology 116 or an equivalent course on the Near East. (3) II (Woodbury)

125 — PHYSICAL ANTHROPOLOGY. A detailed course treating man as a biological organism. Lectures on measuring techniques, the primates, fossil man, races, racial admixture, growth, dentition, and osteopathology. Three hours lecture and two hours laboratory, paper preparations.

Prerequisite: Anthropology 1 or four hours in any other biological science. (4) II (Snow)

126 — HUMAN ANCESTRY. A detailed study of human origins and the fossil remains of Pleistocene Man throughout the world. The ancestral lineage, formation and intermixture of modern racial groups will be stressed. The relationships between body build, racial type and temperament (Constitutional Anthropology) will be reviewed. Three hours lecture, recitation; two hours laboratory, selected readings and paper preparation.

Prerequisite: Anthropology 125 or permission of instructor. (4) II (Snow)

130 — NORTH PACIFIC COAST CULTURES. Ethnology of the maritime peoples of western North America and Northeast Asia. Cultural connections between America and Asia will be stressed. Lectures, 3 hours.

Prerequisites: Anthropology 1 and 2. (3) I (Essene)

131 — ETHNOLOGY OF OCEANIA. A survey of the various cultures to be found on the islands of the Pacific Ocean. Both aboriginal and modern acculturated societies will be considered. Lectures, 3 hours.

Prerequisites: Anthropology 1 and 2. (3) II (Essene)

140 — MYTHOLOGY. The unwritten literature of primitive peoples. Diffusion, style, literary devices and function of myths. Students will prepare a short paper on results of library research as main objective of course. Lectures, 3 hours.

(3) II (Essene)

141 — APPLIED ANTHROPOLOGY. The application of anthropological methods to contemporary practical problems. Basic concepts and general conclusions of anthropological research will be given as essential background material. The application of these principles to such problems as acculturation, colonial administration, intercultural education, and race relations will constitute the major part of the course.

Prerequisite: Anthropology 2. (3) II (Essene)

150a-d — TUTORIAL SEMINAR. Anthropological methods and theory. (2) I, II (Staff)

201a, b — SEMINAR. Intensive work in particular fields of anthropology. All students during a given semester will be assigned related phases of the same problem. Designed primarily for students working toward a master's degree in anthropology. (2) I, II (Staff)

BUSINESS EDUCATION (See Education)

COMMERCE (See Economics and Commerce)

ECONOMICS AND COMMERCE**DEPARTMENTAL REQUIREMENTS FOR THE MASTERS
DEGREE IN ECONOMICS AND COMMERCE**

In addition to the general regulations of the Graduate School the candidate for the master's degree in economics or commerce must satisfy departmental requirements as outlined below.

He must have a knowledge of course material in accordance with the following distribution:

- (1) The fundamentals of economic history.
- (2) Advanced economic theory which for economics majors must include both current economic theory and its historical development, while for commerce majors it may be confined to modern or current theory.
- (3) A knowledge of elementary statistics.
- (4) A knowledge of introductory accounting.
- (5) Knowledge of a reasonable range of institutional economics courses which must include money and banking and public finance and two additional fields, as for example, labor and public utilities for economics majors, or marketing and management for commerce majors.

With the advice and consent of the major professor and the dean the student may modify the requirement as to the spread of institutional courses in economics and commerce.

The student's major and minor fields in terms of courses must be approved by his major professor.

A thesis must be written in the student's field of major interest.

The student must acquire at least one semester hour in the economics seminar which is to be taken preferably during the second half of his residence period. By this time he will be ready to begin work on his thesis and report at intervals before the seminar.

The candidate must pass a written comprehensive examination on the range of subject matter and an oral examination on the thesis.

**DEPARTMENTAL REQUIREMENTS FOR THE DOCTOR'S
DEGREE IN ECONOMICS**

Before taking the qualifying examination through which the student secures the status of a candidate for the degree of Doctor of Philosophy as required by the regulations of the Graduate School, it is expected that the student will have met the requirements for the master's degree as to general distribution of course material or the substantial equivalent.

The scope of the qualifying examination will include a comprehensive written test of the student's ability to deal with economics materials and will cover the following classes of subject matter: (1) elementary accounting, statistics, and economic history; (2) advanced economic theory; (3) four

other fields in economics or in business; (4) a minor subject closely related to economics, such as business administration, political science, agricultural economics, or sociology.

If the student has passed an examination covering the range of course material required for the master's degree, with the approval of his special committee, the examination need not include the subjects in class one.

The oral part of the qualifying examination will be administered ordinarily in connection with a seminar and will test the student's preparation and ability to do research in his chosen field of specialization.

Suggested *fields of study* in economics and commerce and possible courses comprising such fields are as follows:

Economic theory: Economics 110, 115, 153, 203, 204, 218a, b; and Farm Econ. 202a, b, 203.

Economic history: Economics 125, 134, 147 and 148.

Statistics: Economics 107, 142 and 210; Commerce 149 and 150; Math. 120; and Psy. 215.

Public finance: Economics 104, 124, 157, 206a, b, 207a, b; Commerce 133 and 159; Law 153, 161a, b; and Political Science 177a, b.

Public finance: Economics 104, 124, 157, 206a and b, 207a and b; Commerce 133 and 159; Law 153, 161a and b; and Political Science 177a and b.

Industrial relations: Economics 102, 130, and 155; Law 180; Psychology 106; and Political Science 177b.

Utilities and transport: Economics 103 and 126; and Law 150, 161a, b.

Accounting: Commerce 108, 113, 118, 129, 132a, b, 133, 146, 159, and 222.

Industrial management: Commerce 118, 137, 138, 139, and 145; Economics 155; and Psychology 106.

Marketing: Commerce 119, 136, 140, 141, and 149; Economics 127; and Mar. and R. F. 101.

Risk and risk bearing: Commerce 143 and 144; and Law 145.

Normally two or three courses should represent the minimum level of achievement in each field covered by the qualifying examination, and economic theory should include a course in business cycles.

Of the total semester hours presented by the candidate for the degree not less than fifteen semester hours must represent courses and seminars numbered 200 and above.

DESCRIPTION OF COURSES

ECONOMICS

102 — LABOR ECONOMICS. Insecurity, wages and income, substandard workers, industrial conflict; wage theories, the economics of collective bargaining, unionism in its structural and functional aspects; recent developments.

Prerequisite: Economics 51.

(3) I (Carter)

103 — TRANSPORTATION. Railways, waterways, highways, airways. Rates, service, management, regulation.
Prerequisite: Economics 51.

(3) I (Sullivan)

104 — PUBLIC FINANCE. A study of public receipts; public expenditures; the principles of taxation with special reference to their application to the tax systems, federal and state.
Prerequisite: Economics 52.

(3) I (Martin and Sullivan)

105 — MONEY AND BANKING. Nature and functions of money; the importance of credit; relation of money and credit to prices; bank deposits and loans; complete study of our national banking system.
Prerequisite: Economics 52.

(3) I, II (Masten)

107 — STATISTICAL METHOD — Introduction to the sources of business data, the use of calculating machinery, tabulation, simple charts and graphs, the average, dispersion, correlation, and time series analysis.

(3) I (Connor and Massie)

110 — BUSINESS CYCLES. The nature and characteristics of the economic factors which underlie the cyclical fluctuations in business conditions; the methods of business and investment forecasting.
Prerequisites: Economics 51 and an elementary course in statistics.

(3) I, II (Haynes)

112a-f — INDIVIDUAL WORK IN ECONOMICS. Students confer individually with the instructor

(1) I, II (Staff)

115 — VALUE AND DISTRIBUTION THEORY. The major emphasis is on current theory.

(3) I (Sullivan)

124 — STATE AND LOCAL TAXATION. Classified property taxes; separation of sources of revenue, taxation of banks, forests, public utilities, mines, and rural and urban real estate; income, inheritance and sales taxes.

(3) II (Martin)

125 — EVOLUTION OF ECONOMIC INSTITUTIONS. The rise of economic institutions such as property rights, capital formation, contractual labor, *et cetera*, as influenced by the family, the city-state, nationalism, commerce, finance, the manor, the guilds, and the industrial revolution.

Prerequisite: Economics 52 or permission of instructor. (3) II (Jennings)

126 — ECONOMICS OF PUBLIC UTILITIES. No credit for this course can be given if the student has credit for Political Science 158. Growth and development of public utilities; valuation; rate-making; financing; the holding company; regulation; current problems; accounting.

Prerequisite: Economics 52.

(3) I (Haynes)

127 — INTERNATIONAL ECONOMICS. Modern fallacies respecting foreign trade; free trade; protectionism; preferential tariffs; colonial tariff policies; dumping; commercial treaties; control of raw materials; encouragement of shipping; international investments and the movement of capital; international debts; reparations.

Prerequisite: Economics 52.

(3) II (Sullivan)

130 — LABOR LEGISLATION. The status of labor law, mediation, conciliation, arbitration, the minimum wage, the eight-hour day, unemployment relief, safety and health legislation, and social insurance.

Prerequisite: Economics 51.

(3) II (Carter)

134 — ADVANCED ECONOMICS HISTORY OF THE UNITED STATES. An advanced study of English colonial policy, population growth, immigration, territorial expansion, agriculture, manufactures, tariff, labor, industrial combinations, commerce, transportation facilities, money and banking, and conservation. (3) II (Jennings)

142 — INDEX NUMBERS. The problems of sampling, selection of formula, and weighting in the construction of index numbers; a study of the construction and use of the common index numbers of prices and production. *Prerequisite: an elementary course in statistics.* (2) II (Connor)

147 — AMERICAN BUSINESS LEADERS. Biographical sketches of a selected list of men including their business achievements and their relationships to the economic and social life of their time. *Prerequisite: Economics 3 or permission of instructor.* (2) I (Jennings)

148 — EUROPEAN BUSINESS LEADERS. Biographical sketches of a selected list of men including their business achievements and their relationships to the economic and social life of their time. *Prerequisite: Economics 2 or permission of instructor.* (1) II (Jennings)

153 — THE ECONOMICS OF CONSUMPTION. The place of consumption in economic theory with special emphasis upon its relation to the phases of the business cycle including the institutional background of our consumer habits; sources of information on consumption; and government regulation of consumer standards. *Prerequisite: Economics 51.* (2) II (Sullivan)

154 — URBAN REAL ESTATE. Urban land economics, the growth and planning of urban communities, survey of the real estate business and institutions, essentials of real estate law and contracts, the financing of real estate transactions, the problem of property valuation and appraisal, the management of real estate properties, the problem of ownership versus rental, and the problem of real estate securities as investments. Governmental activities. *Prerequisite: Economics 52.* (3) II (Pickett)

155 — INDUSTRIAL RELATIONS. Historical development of industrial relations; the economic implications of job analysis, recruitment, selection and training for industry; wages, hours, promotion and health policies; employee representation, collective bargaining, established policies, practices, and procedures under the law; union-management cooperation, building morale, and the public service. *Prerequisite: Economics 51.* (3) II Carter

157 — GOVERNMENT FINANCE ADMINISTRATION. Government budget, accounting, debt, purchasing, treasury, revenue, and auditing administration is examined; illustrations are drawn from federal, state, and local experience. Each student makes a special report on finance-management study or experience. (3) II (Martin)

202a-f — SEMINAR. An extended investigation of some specific topic with a view to giving training in methods of research and studying intensively a particular subject in the field of economics. (1) I, II (Carpenter)

203 — HISTORY OF ECONOMIC THOUGHT. A survey of the history of economic thought from the ancient period to about the end of the Classical School. *Prerequisite: Economics 52.* (3) I (Hargraves)

204 – SURVEY OF ECONOMIC THEORY SINCE THE AUSTRIAN SCHOOL. This course is virtually a continuation of course 203.

206a – MUNICIPAL FINANCE. City and county budget and related problems are studied in reports and seminar. (2) I (Martin)

206b – MUNICIPAL FINANCE. City and county debt, purchasing, treasury, and revenue problems are studied in reports and seminar. (2) II (Martin)

207a, b – PROBLEMS IN PUBLIC FINANCE. Depending on varying needs of public finance students from time to time, specific subject matter will be selected for study. Each student's report will indicate the class of problems intensively examined. (2) I, II (Martin)

209 – HISTORY AND THEORY OF MONEY AND PRICES. The evolution of money, the rise of banking processes and the causes of fluctuations in the general price level. (3) II (Carpenter)

210 – RESEARCH STATISTICS. The place of statistics in research method, the theory of statistical averages, the application of advanced statistical methods to economic data, the statistical meaning of economic concepts and the testing of economic theory.

Prerequisites: an elementary course in statistics. (2) II (Connor)

211 – ADVANCED MONEY AND BANKING. A theoretical study of contemporary money and banking institutions with emphasis on central bank functions. (3) II (Carpenter)

212a-f – RESEARCH PROBLEMS IN ECONOMICS. Students confer individually with the instructor. (1) I, II (Staff)

218a, b – ECONOMIC THEORY. An intensive course covering the whole field of contemporary economic theory and the various analytical techniques used therein.

Prerequisite: Economics 51 and 52. (3) I, II (Haynes)

COMMERCE

101a-c – SECRETARIAL JOB TRAINING. This course is designed to provide laboratory and office experience for senior secretarial students.

Prerequisites: Commerce 14b. (1 each) I, II (Thomas)

108 – ACCOUNTING THEORY. The function of accounting, asset valuation, recognition of revenue and expenses, and classification of equities will be studied with a view to presenting a coordinated body of accounting theory.

Prerequisite: Commerce 96b. (2) I (Haun)

109a, b – BUSINESS LAW. A survey of the principles of contracts, sales, bills and notes, and that portion of the law of torts applicable to business practices. (3) I, II (Haun and Lewis)

113 – AUDITING. The theory of auditing, the valuation of assets, analysis of accounting procedure, and the presentation of statements. Special problems applicable to particular businesses will also be presented.

Prerequisites: Commerce 7b. (3) II (Beals)

117 — CORPORATION FINANCE. Stocks and bonds, sound fiscal principles concerning the issue of securities, the management of the corporate income, the disbursement of dividends, the creation of sinking funds, and reorganization procedure.

Prerequisites: Commerce 7b; and Economics 52. (3) I, II (Pickett)

118 — COST ACCOUNTING. The place of cost accounting in the general field of accounting, special records and cost statistics, and application to particular businesses.

Prerequisite: Commerce 7b. (3) I (Beals)

119 — RETAIL MERCHANDISING. Selecting a business location, internal layout, departmentalization, merchandising control, store policies toward the public, training and management of personnel, and related subjects.

Prerequisite: Commerce 60. (3) II (McIntyre)

128 — ADVANCED COST ACCOUNTING. The use of standard costs, estimated cost systems and procedures, non-manufacturing costs, budgetary control, and management uses of cost data.

Prerequisite: Commerce 118. (3) II (Beals)

129 — CREDIT AND STATEMENT ANALYSIS. The theory underlying credit-granting; credit administration; analysis and interpretation of financial statements.

Prerequisite: Commerce 7a. (2) I (Haun and Beals)

131 — INVESTMENTS. The general field of investments. Emphasis is placed upon problems which face the investor rather than the seller of securities. Analysis of corporation statements for investment purposes; the security market; market influences on security prices; effect of interest changes on security prices; analysis of specific types of investments; and the development of investment programs.

Prerequisite: Commerce 117. (3) II (Pickett)

132a, b — C. P. A. PROBLEMS. This course is designed to prepare students for C. P. A. examinations. Advanced accounting theory is stressed through the study of a wide range of problems.

Prerequisites: Commerce 96b and 146. (3) I, II (Haun and Beals)

133 — INCOME TAX PROCEDURE. The preparation of income tax returns for individuals and corporations of all classes and a practical application of principles of accounting.

Prerequisite: Commerce 96b. (3) II (Haun)

136 — SALES MANAGEMENT. The case method is used, supplemented with outside reading and written reports.

Prerequisite: Commerce 60. (3) I (McIntyre)

137 — INDUSTRIAL MANAGEMENT. Emphasis is placed upon factory management, but an attempt is made to coordinate managerial aspects of business in its entirety. Approximately half of the semester is devoted to the consideration and criticism of business reports dealing with various managerial problems and prepared by members of the class.

Open only to students who have had the necessary prerequisite training. (3) I, II (Carter and Haynes)

138 — CASES IN MANAGEMENT. Emphasizes production, plant layout, wage payments, personnel management, production control, and related problems.

Prerequisite: Commerce 137.

(3) II (Haynes)

139 — INDUSTRIAL PURCHASING. Organization of purchasing; relations with other departments in manufacturing; qualifications and training of buyers. Purchasing procedures; sources of supply; price negotiation; store control; value analysis, purchasing policies and budgets. Cases are used to demonstrate current practices.

Prerequisite: Economics 51.

(3) II (Coolsen)

140 — PROBLEMS IN ADVERTISING. A study of specific problems confronted by the marketing executive in the use of advertising as a selling tool, and of the general economic effects of advertising.

Prerequisite: Commerce 62.

(2) I (McIntyre)

141 — INDUSTRIAL MARKETING. The marketing of goods and services intended for business use rather than for personal consumption. A study of the structure of the industrial market and of the special problem encountered in the marketing of such products as raw materials, parts, and machinery to manufacturing, agricultural, mininm, construction, trade and other industries.

Prerequisite: Economics 51.

(3) I (Coolsen)

143 — LIFE INSURANCE. Economics of life insurance; organization and control; special forms of life insurance; fundamental principles of rate-making.

Prerequisite: Economics 51.

(3) I (Hargreaves)

144 — PROPERTY AND CASUALTY INSURANCE. Public control; nature of contracts; analysis of reserve functions and rate-making processes.

Prerequisite: Economics 51.

(3) II (Pickett)

145 — OFFICE MANAGEMENT. Planning and scheduling of work; employment procedures; supervision of employees, re-training, promotion; equipment.

(3) II (Speck)

146 — SPECIALIZED ACCOUNTING PROBLEMS. Fiduciary accounting, consolidations and mergers, foreign exchange and foreign branches or subsidiaries, utility accounting, and stock brokerage accounting.

Prerequisites: Commerce 96a, b.

(3) II (Grady)

149 — MARKETING RESEARCH. Training in the application of scientific method to research in fields of marketing. A major marketing investigation will be conducted by the class.

Prerequisites: Commerce 60 and a course in statistics.

(3) I (Coolsen)

150 — BUSINESS STATISTICS. Advanced statistical techniques with special application in economics and business; a survey of the work of government and private research organizations; a study of general research methods, indicating the importance of each type; and training in the application of statistical and other techniques to business data.

Prerequisite: an elementary course in statics.

(2) I (Connor and Massie)

156 — BUSINESS REPORTS. Major emphasis is placed upon sources of data, compilation and arrangement of data, documentation, bibliographies and effective presentation of reports. Problems are assigned in the various areas of interest.

(2) I, II (Speck)

159 – GOVERNMENTAL ACCOUNTING. The requirement of adequate accounting systems for various governmental units, including the recording of usual transactions and the form and content of reports.
Prerequisite: Commerce 7b. (2) II (Beals)

160 – BUSINESS COMBINATIONS. Forms of combination; the problem of monopoly; federal and state anti-trust legislation and court decisions.
Prerequisite: Economics 51. (2) II (Massie)

162 – SMALL BUSINESS OPERATION. Application of management principles and techniques to the special problems of establishing and operating a small business enterprise. The course includes the study of several comprehensive cases or projects, which are selected to fit special interests of the students.
 () II (Coolsen)

165 – COMPARATIVE ECONOMIC SYSTEMS. A study of capitalism, socialism, fascism, communism and cooperation, with attention to current experiments in economic planning.
Prerequisite: Economics 51. (3) I (Masten)

218a, b – ECONOMIC THEORY. An intensive course covering the whole field of contemporary economic theory and the various analytical techniques used therein.
Prerequisite: Economics 51. (3 each) I, II (Haun)

222 – TAX ACCOUNTING PROBLEMS. A consideration of advanced tax accounting problems of a complex nature involved in income taxes, gift taxes, and death taxes under the federal and state laws. Designed for those students primarily interested in tax administration or tax accounting practice.
Prerequisite: Commerce 133. (3) II (Haun)

EDUCATIONAL PSYCHOLOGY (See Education)

FARM ECONOMICS (See Agriculture)

HISTORY

The Master's Degree in History

Students should submit evidence of good undergraduate preparation in the specific subject in which they propose to take the degree. In general, sixteen semester hours in history will suffice.

Unity of purpose and coherence in planning the program is an essential. At least one course should be of the seminar type, with some training in methods of graduate study.

Of the total number of hours, two-thirds will be required in history when a minor is offered in addition to the thesis.

An acceptable thesis which conforms to sound rules of historical research is required of every candidate. This thesis should indicate knowledge of sources, synthesis and bibliography. An examination will include courses, thesis, topic, and generally related materials.

The Doctorate in History

Those who seek the doctorate in history should follow carefully the general directions governing the subjects of residence and courses as stated in the first part of this Bulletin.

The *applicant* does not become a *candidate* until he has satisfied the language requirements, passed the qualifying examination and has been approved by the Graduate School.

All further work for the doctorate in history is under the direction of a committee composed of members of the staffs of the candidate's major and minor departments appointed by the Dean of the Graduate School. The chairman will be the major professor under whose direction the candidate expects to write his dissertation. The student should consult this person at his earliest convenience. This committee with the student will outline his course of study, advise with him throughout his residence, conduct the comprehensive examination, and generally supervise the writing of his dissertation.

The candidate must submit to examinations in five fields in at least three areas of history, and he must offer two fields from the area of his major interest.

Area I. European History

- a. ancient and medieval
- b. modern Europe to 1815
- c. Europe since 1815

Area II. British History

- a. the history of England
- b. the British empire

Area III. American History

- a. colonial and revolutionary America to 1789
- b. United States history, 1789-1876
- c. the United States since 1876
- d. regional and local history

Area IV. Oriental History

- a. the Far East
- b. the Near East

Area v. Latin America

Area VI. Minor Subjects

I. American History

100a, b — THE DIPLOMACY AND FOREIGN POLICY OF THE UNITED STATES TO 1898. A survey designed to acquaint the student with the principles of American foreign policy and their historical evolution in practice.

Prerequisite: History 5a or equivalent.

(3) I (Vandenbosch)

105a — COLONIAL AMERICA. A study of the foundation of the English colonies; their political, social, and economic development; extension of their frontiers, inter-colonial wars, and external relations with the Dutch, French and Spanish. Emphasis on imperial policies and imperial control and the colonial controversies.

Prerequisite: one year of American or European History. (3) II (Gilliam)

105b — The American Revolution, 1763-1789. This course deals with the American Revolution and the beginning of the United States as a sovereign nation. It discusses the causes of the Revolutionary War, traces the course of that struggle, analyzes the venture under the Articles of Confederation, and explains the change under the Constitution to a permanent form of government. *Prerequisite: one year of American or European history.* (3) II (Taylor)

106a — COLONIAL LATIN AMERICA. A survey of the founding and development of the Latin American Colonies and their struggle for independence. (3) I (Staff)

106b — LATIN AMERICAN REPUBLICS. This course will involve a study of the political, economic and social institutions, and problems of the Latin American Republics from attainment of independence to the present. (3) II (Staff)

124a — SOCIAL AND CULTURAL HISTORY OF THE UNITED STATES TO 1830. This course deals with changing phases of social and cultural life in America in an effort to establish the background of American society by examining the forces which have influenced the cultural growth of the nation. (3) I (England)

124b — SOCIAL AND CULTURAL HISTORY OF THE UNITED STATES SINCE 1830. This course is a continuation of 124a. (3) II (England)

140a-d — INDEPENDENT WORK. Under special conditions selected students may investigate special problems, with weekly reports to the instructor. (2) (Staff)

141 — TUTORIAL READING. (1) (Staff)

146 — HISTORY OF THE UNITED STATES, 1877-1901. This course deals with American history since the end of reconstruction up until the turn of the century. It will discuss the economic, political and intellectual forces which went into the development of a nation of world wide significance. (3) I (Wall)

147 — RECENT HISTORY OF THE UNITED STATES. An intensive study of the principal movements and episodes in the history of the people of the United States from the Spanish-American War to the present. *Prerequisite: one year of American History.* (3) I (Clark)

151a — THE AMERICAN FRONTIER. A course dealing specifically with American expansion westward from the original colonies. This course will consider the westward movement in respect to population, political, economic, social and cultural development; analyze the process of national adjustments; and weigh the contributions of each succeeding period. It will consider the early west.

Prerequisites: History 5a, b or equivalents. (3) I (Clark)

151b — THE AMERICAN FRONTIER. A continuation of 151a. It will consider the Trans-Mississippi West.

Prerequisites: as for History 151a. (3) II (Clark)

180a — HISTORY OF THE OLD SOUTH. A study of the colonial beginnings and expansion of southern life, economics, and society. The growth of slavery, staple agriculture, and sectional politics will constitute the major interest. The course will consider the various points of sectional development which led to the break up of the Union. The South will be interpreted in both its relationship and contrast to national development.
Prerequisite: History 5a or equivalent. (3) I (Eaton)

180b — THE SOUTH IN THE CIVIL WAR AND RECONSTRUCTION. An intensive study of constitutional theories as a background for secession. The political, social and constitutional history of the Confederacy and the Reconstruction of the Southern States.
Prerequisite: History 5b or equivalent. (3) II (Eaton)

180c — HISTORY OF THE NEW SOUTH. The evolution of southern life and society, agrarian politics, relationships with other sections, industrial growth, and new leadership.
Prerequisite: History 180a. (3) II (Clark)

II. England and the British Empire

131a — ENGLISH CONSTITUTIONAL HISTORY TO 1603. A study of the backgrounds of the English constitution; the Anglo-Saxon contribution; the Norman conquest and development of governmental and legal institutions during the 12th and 13th centuries; the rise of Parliament; the Tudor strong monarchy to its close in 1603.
(3) I (Cone)

131b — ENGLISH CONSTITUTIONAL HISTORY SINCE 1603. A continuation of 131a. The constitutional struggle between the Stuart kings and Parliament; triumph of constitutional monarchy; rise of the Cabinet; effect of the spread of democracy in recent times.
(3) II (Cone)

134 — HISTORY OF CANADA. A brief survey of Canada under the French; increasing emphasis on the development of Canada under British control; evolution of the Dominion; relation with the United States and British Commonwealth of Nations.
Prerequisite: one year of college history. (3) II (Cone)

135a — THE BRITISH EMPIRE TO 1860. Review of the various elements affecting Great Britain and its Empire between 1783 and 1860; the Industrial Revolution; the French Revolution; development of British Sea Power. The early growth and development of Canada, Australia, New Zealand, South Africa and India. Lectures, class discussions, readings, reports.
(3) I (Cone)

135b — THE BRITISH EMPIRE SINCE 1860. A continuation of 135a. Great Britain and the growth of the Dominions and the Commonwealth since 1860. Particular attention given to the history of the Dominion of Canada and extension of the idea to other portions of the Commonwealth; their relations with the rest of the world.
(3) II (Cone)

138 — BRITISH SOCIAL HISTORY DURING THE TUDOR PERIOD, 1485-1603. A study of British life, manners, and customs in town and country. Particular emphasis will be placed upon the age of Elizabeth, with political events subordinated to social changes. Lectures, discussion and reports.
(3) II (Cone)

139 — BRITISH HISTORY SINCE 1815. A detailed study of Britain's political, social, diplomatic and industrial development during the modern period. Special consideration will be given the part played by Britain in World War I and World War II and to her position in the contemporary world.

(3) I (Cone)

III. European History

114 — THE RENAISSANCE AND REFORMATION. The course is designed for a study of the birth of modern spirit and institutions. Among the topics studied will be the rise of universities and professions, the expansion of commerce and finance, exploration, the interest in culture and art, the break-up of the Medieval Church, the Wars of Religion of the Sixteenth Century, the birth of National States, and the movement toward royal absolutism.

Prerequisite: History 8a or 4a.

(1) (McCloy)

119a — THE FRENCH REVOLUTION AND NAPOLEON. A study of the period 1789-1815 in Europe, treating of the appearance and manifestation of the spirit of revolt. Conditions in France and adjoining nations, the evolution of France from 1778 to 1795 and subsequent changes under Napoleon. Open to juniors, seniors and graduate students, with supplementary reading for the latter.

(3) II (McCloy)

119b — THE NINETEENTH CENTURY. Starting with the fall of Napoleon, this course treats the successive political changes in 1823, 1830, 1848 and 1871, together with the outstanding commercial, cultural and scientific features of European life after 1815; the expansion of Europe in Africa and Asia, and the reactions upon the great states of the world.

(3) II (Lunde)

120 — THE TWENTIETH CENTURY. A study of recent and contemporary movements, chiefly in Europe. The rise and conflict of the chief colonial empires; European interference and control in Asia and Africa; forces and elements leading up to the great war; general features of the past twenty-five years, including socialism, public education, invention and discoveries. Reports on current literature and assigned reading on a liberal scale.

(3) I (Staff)

171 — EUROPE IN THE EIGHTEENTH CENTURY. The development of the absolute state with special emphasis on France under Louis XIV; the evolution of Russia and Prussia as new European powers; the social and intellectual influences of the enlightenment.

Prerequisite: History 4a or its equivalent.

(3) II (Lunde)

Courses in the "200" Group

These courses are for graduate students. They are content courses presented by the lecture and discussion method and as such are distinct in character from the "300" group, which is concerned with problems and the practice of research.

202 — THE AMERICAN REVOLUTION. Seminar.

(3) II (Gilliam)

206 — THE CONFEDERATION OF THE U. S.

(3) (Eaton)

247a-d — SEMINAR IN RECENT UNITED STATES HISTORY. Intensive studies in the political, social, and cultural history of the United States since 1914. Different topics will be stressed in rotation. (3) (Clark)

281 — AMERICAN HISTORIOGRAPHY.

(3) I (Clark and Eaton)

282 — HISTORICAL CRITICISM.

(3) (Staff)

Courses in the "300" Group

SEMINARS — Basically research in character. These are not content courses. They provide special training in historical research (collection and critical analysis of bibliography, note-taking and organization of materials, and the presentation of a properly documented thesis). It is desirable that the student take the Senior Seminar before enrolling in "300" courses. Two class hours and 1 conference hour.

American Group

300a-d — SEMINAR IN AMERICAN FOREIGN DIPLOMACY.

(3) I (Vandenbosch)

315a-d — HENRY CLAY (AND HIS TIMES).

(3) (Clark)

342 — SEMINAR IN KENTUCKY HISTORY. The development of Kentucky as a Western commonwealth, with emphasis on economic and political phases from the 18th century to the present, with writing of papers based upon research among documents and other source materials. (3) (Clark)

365 — THE AMERICAN CIVIL WAR.

(3) (Eaton)

366 — RECONSTRUCTION.

(3) (Eaton)

European Group

320a-d — ORIGINS OF THE GREAT WAR. Seminar.

(3) II (Staff)

331 — SEMINAR IN MODERN BRITISH HISTORY.

(3) II (Cone)

350a-d — SEMINAR IN THE FRENCH REVOLUTION.

(3) (McCloy)

HISTORY OF EDUCATION (See Education)

LAW (See Law)

MARKETS AND RURAL FINANCE (See Agriculture)

PHILOSOPHY

101a — HISTORY OF PHILOSOPHY — ANCIENT AND MEDIEVAL. A survey of the philosophical thought of ancient Greece and Rome, and of medieval Christendom. (3) I (DeBoer)

101b – HISTORY OF PHILOSOPHY – MODERN. A survey of modern European and American philosophy from the Renaissance to contemporary times. (3) II (Kuiper)

102 – CONTEMPORARY PHILOSOPHY. A study of contemporary philosophical tendencies against their historical background, notably idealism, pragmatism, realism, and naturalism. Writings of their American spokesmen (Royce, James, Dewey, Santayana, Whitehead) are closely studied, while correspondences with Europeans (Russell, Bergson, etc.) are noted.

(3) I (Melzer)

106 – REPRESENTATIVE MODERN PHILOSOPHERS. A study in the original works of the chief figures in modern philosophy. Special attention will be given to Descartes, Spinoza, Locke, Hume, and Kant. (3) (Kuiper)

109a-d – INDEPENDENT WORK. Open only to students who have distinguished themselves in Philosophy or in allied subjects.

(3 ea.) I, II, S (Staff)

115 – INTERMEDIATE LOGIC. A second course in logic, including the logic of classes, of relations, of propositions and propositional functions, the theory of deductive systems; and a consideration of the rival schools of contemporary logical theory.

(3) (Kuiper)

118 – THE PHILOSOPHY OF PLATO. Plato against the background of his society with its contending cultural ideals; his philosophical development as mirrored in the chief dialogues, such as *Gorgias*, *Protagoras*, *Theaetetus*, *Sophist*, *Parmenides*, *Philebus*, *Timaeus*, portions of *Republic* and *Laws*, which reveal his achievements in cultural analysis, ethics, psychology, theory of knowledge, metaphysics, and cosmology. Lectures, discussion, reading and outlines of selected passages.

(3) (DeBoer)

119 – THE PHILOSOPHY OF ARISTOTLE. Reading and discussion of passages in Aristotle's major systematic works: *Physics* (cosmology or natural philosophy); *Metaphysics* (investigation of the most general principles); *De Anima* (psychology and the analysis of human knowledge); *Categories*, *Prior and Posterior Analytics* (topics in logic, the structure of scientific knowledge, human knowledge and the real); *Nicomachean Ethics*, *Politics* (moral and social life). Lectures, outlines.

(3) (DeBoer)

120 – GREAT RELIGIONS. A descriptive survey of several religions as they developed within their culture, for example: Confucianism, Shintoism, Hinduism, Buddhism, Judaism, Christianity.

(3) (DeBoer)

125 – PHILOSOPHY OF RELIGION. A philosophical examination of religious ideas, including such topics as the origin of religion; the nature of religion; the various conceptions of God, the soul, sin and salvation; and some consideration of the relationships between religion and other aspects of life, such as art, science, and practical activity.

(3) (Melzer)

130 – METAPHYSICS. Investigation of major problems and doctrines in the field of philosophy so far as it concerns the general structure of reality: the significance of recent scientific advances; the status of space and time, of change and causality, of events, substance and relation; the nature and status of matter, soul, value, God; an attempt to appreciate the intent and procedure of contending metaphysical theories, such as naturalism, idealism, dualism, monism, mysticism, realism, pragmatism.

(3) (DeBoer)

135 — EPISTEMOLOGY. A study of the origin, nature, kinds, and validity of knowledge, with a consideration of such topics as faith, intuition, belief, opinion, certainty, and probability. Also some discussion of recent developments in semantics. (3) (Kuiper)

201a, b — SEMINAR IN PHILOSOPHY. One two-hour meeting a week for discussion of current developments in philosophy as found in books and periodicals. Readings and reports. (2) (Staff)

210a, b — TYPES OF LOGICAL THEORY. An intensive study of recent and contemporary contributions to logical theory; C. I. Lewis, N. Whitehead, B. Russell, R. Carnap, John Dewey and others. (3) (Kuiper)

220a, b — RESEARCH IN PHILOSOPHY. This course is primarily intended for advanced students who desire and are prepared to do research in philosophy. (3) (Staff)

PHILOSOPHY OF EDUCATION (See Education)

POLITICAL SCIENCE

Graduates of accredited colleges may become candidates for a master's degree in political science. Students who are deficient in social science background must make up their deficiencies by taking such additional courses as may be recommended by the Department. At least one course each in Political Theory and Constitutional Development is required of every candidate. This requirement will be waived in the case of candidates who have had adequate undergraduate courses in these two fields. The graduate work must include at least three of the six fields of political science listed below. At least sixteen of the twenty-four semester hours required for the master's degree must be taken in political science. The remaining hours may be taken in one or more related fields upon approval of the major professor. Six semester hours of the work in political science must be in courses open only to graduate students.

Admission to candidacy for the doctor's degree in political science is governed by the regulations of the Graduate School, which requires a qualifying examination during the second year of graduate work. Of the total semester hours presented by the candidate at least twelve semester hours must be in courses not open to undergraduates. At the end of his course work the candidate must pass a preliminary written and oral examination in the following fields: Political Parties and Public Opinion, Public Administration, Theory, Comparative Government, Public Law and International Law and Diplomacy, with the exception in each case of the field in which the candidate writes his dissertation. A minor in a related field may be substituted for two of the six fields of political science, subject to the approval of the other department and of the candidate's committee. Candidates for the doctor's degree in a related department desiring a minor in political science must pass a preliminary examination in two of the six fields of political science. At least six semester hours of the work in political science must be in courses not open to undergraduates. Candidates for either a major or a minor in political science are expected to have a knowledge of the related social studies as a background for the work in political science.

Upon completion of the above requirements the candidate must take an oral examination covering primarily the dissertation and the field in which the dissertation falls.

I. Political Parties and Public Opinion

170 — POLITICAL PARTIES. An analysis of public opinion and pressure groups; a survey of the history, organization methods and functions of political parties in the United States; first hand studies of the individual's participation in government. (3) I (Shannon)

173 — PUBLIC OPINION. The concept of public opinion; public opinion as an agency of political control; influence of the press, radio, and other means of influencing public opinion; propaganda technique and control; competition of pressure groups for political influence. (3) II (Shannon)

179 — POLITICAL LEADERSHIP. A course designed to encourage research into the relations between leaders and followers in politics. Successful politicians are analyzed with respect to the social, biological, and personal factors which account for their political behavior. (3) II, S (Shannon)

Related Courses in other Departments

Psychology 104 — Social Psychology.

II. Public Administration

172 — KENTUCKY GOVERNMENT AND CONSTITUTION. An intensive study of government and administration in Kentucky. The course is intended primarily for teachers of civics in the secondary schools, and for teachers of government in colleges. (3) II (Reeves)

177a — INTRODUCTION TO PUBLIC ADMINISTRATION. A study of theories of administration and organization, problems of line management and control, the principle staff and auxiliary functions and agencies, and the problem of administrative responsibility under democratic government. (3) I, S (Kammerer)

177b — PUBLIC PERSONNEL ADMINISTRATION. An introductory survey of the history and changing concepts of the merit system in public administration, recruitment, position classification, pay policies, employee relations and morale, tenure, promotion, transfer, and training in the public service; the role of the personnel officer and his relationship to management. (3) II (Kammerer)

177c — ADMINISTRATIVE REGULATION. An examination of the regulatory movement, legal bases of regulation, problems in the organization and administration of regulatory agencies, practice and procedure in rulemaking and administrative adjudication, and the extent of judicial control over the regulatory process. (3) II (Kammerer)

Related Courses in other Departments

Economics 102. Labor Problems

Economics 104. Public Finance

Economics 124. State and Local Taxation

Economics 130. Labor Legislation

Law 153. Taxation

Law 167. Administrative Law

Social Work 100. Public Welfare Administration

Sociology 112. Community Organization

Social Work 151. Public Assistance

III. Theory

171a — EARLY POLITICAL THEORY. The political theories of Plato and Aristotle, and Roman Political Thought. Thomas Aquinas, Dante, Christian Political Thought. (3) I (Shannon)

171b — MODERN POLITICAL THEORY. Detailed study of Machiavelli, Hobbes, Locke, Rousseau, Burke, and the theories of the American and French Revolutions, the English Utilitarians, Democratic Political Theory, Socialism, and Communism. (3) II (Shannon)

175 — CONTEMPORARY AMERICAN POLITICAL THOUGHT. Conceptions of the respective roles of national and local governments subsequent to the war between the states; American ideas of *laissez faire* and free enterprise; resistance to monopoly; the new nationalism, the new freedom, the new deal, American development of socialism and communism; current ideas of America's role in world affairs. (3) II, S (Shannon)

Related Courses in other Departments

Philosophy 101a, b. History of Philosophy.

IV. Comparative Government

155a — COMPARATIVE GOVERNMENT — PARLIAMENTARY DEMOCRACIES. A study of the governments of Great Britain and the Dominions, France, and Scandinavia. (3) I, S (Staff)

155b — COMPARATIVE GOVERNMENT — TOTALITARIAN STATES. A study of the totalitarian states of Europe and Asia. (3) II, S (Staff)

168 — THE GOVERNMENTS AND POLITICS OF EASTERN ASIA. An introductory study of the political institutions of China, Japan, the Philippines, Dutch East Indies, and India. Constitutional principles, governmental organization, the party systems, current political issues, and contemporary problems of international relations. (3) I, S (Vandenbosch)

V. Public Law

159a — AMERICAN CONSTITUTIONAL DEVELOPMENT. Chronological survey of the making of the constitution and its interpretation through principal statutes and judicial decisions; some emphasis upon the economic and social interests which influenced this growth. (3) I, S (Trimble)

159b — AMERICAN CONSTITUTIONAL DEVELOPMENT. From the adoption of the Civil War Amendments to the present time. Congressional policies embodied in social-economic legislation; doctrines developed by the Supreme Court; analysis and criticism of chief cases on "due process," congressional powers, and changes in the federal system. (3) II (Trimble)

176 — LEGISLATION. A functional study of legislative bodies and the process of legislation. Emphasis is placed on the organization of legislative assemblies, the operation of the committee system, the actual process of enactment, including the drafting of bills, and the external controls over legislation.
(3) II (Kammerer or Reeves)

Related Courses in other Departments

History 131a, b. English Constitutional History.

Law 149. Municipal Corporations.

Law 161a, b. Constitutional Law I and II.

VI. International Law and Diplomacy

101 — LATIN AMERICAN RELATIONS. The relations between the United States and the Latin American countries, with emphasis on the Monroe Doctrine and Pan-Americanism.
(3) II, S (Staff)

150 — INTERNATIONAL LAW. Sources and sanctions of international law, recognition, intervention, jurisdiction; nationality; protection of citizens abroad; diplomatic intercourse of states; the making, termination, and interpretation of treaties; and the treatment of aliens and international claims.
(3) II (Vandenbosch)

160 — AMERICAN FOREIGN RELATIONS. An examination of the chief principles and problems of American policies, the part of the House, the Senate, the Courts, and the President in the initiation, conduct, and control of foreign policies; the organization of the Department of State, the selection of personnel, and the status and duties of foreign service officers.
(3) I, S (Vandenbosch)

165 — WORLD POLITICS. A study of the most significant problems of world politics, including the fundamental factors governing international relations, the techniques and instruments of power politics, and the conflicting interests in organizing world peace.
(3) I, II, S (Vandenbosch)

166 — THE UNITED NATIONS. Background of the United Nations; the San Francisco Conference; comparison of charter with League of Nations Covenant; functions and development of the chief organs and affiliated agencies; the Great Power Veto; problems; achievements. (3) II, S (Vandenbosch)

Related Courses in other Departments

Economics 127. International Economic Policies.

History 100a, b. The Diplomacy and Foreign Policy of the United States.

History 120. Europe in the Twentieth Century.

History 135a, b. The British Empire.

History 145. Russia since 1900.

History 176. France since 1870.

History 177. Germany since 1870.

History 190a, b. The Far East.

Law 164. Conflict of Laws.

202 — NATIONAL AND REGIONAL PLANNING. A survey of conditions leading to efforts at planning. A study of the theories and principles of planning; a detailed investigation of the regional life of selected areas.
(3) II, S (Shannon)

204 — INTERNATIONAL RELATIONS AND ORGANIZATION. Social and economic factors leading to the establishment of international administrative organs, the International Labor Organization, the League of Nations; the United Nations and related organizations.
(3) II (Vandenbosch)

206 — SPECIAL PROBLEMS IN PUBLIC ADMINISTRATION. A research course in selected problems of public administration. The problems will be selected in accordance with the needs and desires of students registered for the course.
(3) I (Kammerer or Reeves)

211 — THE CONSTITUTION AND CIVIL RIGHTS. The American conception of civil rights as expounded by the Constitutional Fathers and as interpreted by the courts. The social, economic, and political aspects and implications of these rights. Special attention will be given to the decisions of the United States Supreme Court.
(3) I, S (Trimble)

213 — FEDERAL CENTRALIZATION. A study of the shifting of power and control from the states to the federal government as a result of the economic and social development of the country and the resulting alteration of our constitutional system. Special attention will be given to the development of such provisions of the constitution as the commerce clause, the taxing clause, and of grants-in-aid and the more important measures of the New Deal.
(3) II (Trimble)

217 — CONTEMPORARY AMERICAN DIPLOMATIC PROBLEMS. The following topics will be included in the scope of the course, the specific subjects varying from time to time: the Monroe Doctrine, Pan-Americanism, the Open Door, arbitration, limitations of armament, non-recognition doctrine, problems of the Philippines, American-Canadian relations, American-Mexican relations, and such other current issues along this line as may arise from time to time.
(3) I, S (Vandenbosch)

271 — SEMINAR IN CONTEMPORARY POLITICAL THEORY. An intensive study of the nature of the contemporary ideologies of socialism, communism, syndicalism, pluralism, anarchism, fascism, political and social democracy.
(3) I, S (Shannon)

PSYCHOLOGY (See Biological Sciences)

RURAL SOCIOLOGY (See Agriculture)

SOCIAL WORK

Courses in Social Work listed below may be taken for graduate credit. Major programs of study in this field leading to advanced degrees are not offered at the present time.

100 — PUBLIC WELFARE ADMINISTRATION. Philosophy, background, and methods of tax-supported social work. The inter-relationship of

federal, state and local services; standards and supervision as influenced by federal security legislation.

Prerequisite: two courses in social work.

(3) II

105 – CHILD WELFARE SERVICES. A study of community and national programs for child care and protection, including aid to dependent children and other social security services.

(3) I, S (Wetzel)

110 – PSYCHIATRIC INFORMATION FOR SOCIAL WORKERS. An analysis of personality development and behavior patterns with special reference to psychiatric interpretation and their implication for social case work. For majors in the department.

Prerequisite: two courses in social work.

(2) I (Gail)

111a-d – INDEPENDENT WORK. Conferences, assigned readings, reports on minor research problems. Open to majors in the department by special permission.

(1 ea.) I, II, S (Staff)

113 – INTRODUCTION TO SOCIAL CASE WORK I. An introductory course in the generic principles of social case work. Discussion based on selected readings and case records. For majors in the department.

Prerequisite: two courses in social work.

(2) II

116 – SOCIAL WORK RESEARCH AND STATISTICS. A consideration of statistical and other types of research in social work problems with illustrations drawn from current studies of government and private welfare agencies.

Prerequisite: two courses in social work.

(3) I (Wetzel)

122 – FIELD OF SOCIAL WORK. An introduction to the function, method, and philosophy of contemporary social work. The divisions of the field (case work, group work, community organization, institutional work, social action, and research) the relationship of social work to the social sciences and allied professions, and the professional status of social work will be considered.

(3) I, II, S (Staff)

130a – COMMUNITY ORGANIZATION FOR SOCIAL WELFARE. Methods and techniques of social welfare planning for the treatment and prevention of social problems. Analysis of needs and resources, coordination of existing agencies, financing and developing chest and council programs, and the interpretation of social work to the community, will be among the subjects treated.

(3) I, S (Rucker)

130b – COMMUNITY ORGANIZATION FOR SOCIAL WELFARE. A continuation of 130a with special emphasis on the organization and function of national and international welfare agencies.

Prerequisite: 130a or permission of instructor.

(3) II (Rucker)

131 – FIELD PRACTICE IN COMMUNITY ORGANIZATION. One hundred clock hours of supervised work in planning and execution of simple projects in community organization.

(2) I, II (Rucker)

(2) I, II (Rucker)

140a – PRINCIPLES OF SOCIAL GROUP WORK. A critical study of the theories and practices of social group work with reference to the work of public and private agencies in this field.

(3) I, S (Rucker)

140b – ADMINISTRATION AND SUPERVISION OF GROUP WORK AGENCY PROGRAMS. The group work process as applied to agency administration, supervision of staff and volunteers, statistical and process recording, evaluation of program, personnel and committee relationships in the group work field.

Prerequisites: S.W. 40a or permission of instructor. (3) II (Rucker)

144a, b – FIELD PARTICIPATION IN GROUP WORK PROGRAMS. Supervised experience in the practice of group work in connection with a program in a local group work agency. For senior majors specializing in group work.

Prerequisites: S.W. 140a and permission of instructor. (2) I, II, S (Rucker)

151 – PUBLIC ASSISTANCE PROGRAMS. A study of the current function of public assistance upon the federal, state, and local levels with emphasis on the public assistance provisions of the Social Security Act, general relief, and work relief policies.

Prerequisite or concurrent: S.W. 122.

217 – GENERIC SOCIAL CASE WORK. An introductory course for graduate students with emphasis upon the application of case work in problems of increasing complexity.

Prerequisite: S.W. 113, or special permission. (2) I

220a – SUPERVISED FIELD WORK. 150 clock hours of supervised field work in a public or a private agency. (2) I, II

221 – ADVANCED SOCIAL CASE WORK I. An advanced course built around the theoretical aspects of case work problems encountered by the students in their field work, and supplemented by cases presenting other problems. (2) II

225 – SOCIAL INSURANCE. A study of social insurance in Europe and the United States. Emphasis will be given to the problems in administration, financing, and coverage. (2) II (Wetzel)

SOCIOLOGY

The following advanced degrees with major work in sociology are available: Master of Arts, Master of Science, Master of Science in Agriculture, and Doctor of Philosophy.

The University of Kentucky has two departments concerned with sociology: the Department of Sociology in the College of Arts and Sciences and the Department of Rural Sociology in the College of Agriculture and Home Economics. However, a coordinated program of graduate instruction in sociology is offered jointly by the staffs in Sociology and Rural Sociology and one of the senior staff members is Chairman of Graduate Study. Under this plan a graduate student wishing to apply for a degree in sociology is assigned an adviser from the Rural Sociology Department or the Sociology Department, according to his field of interest.

In addition to resident teaching, the staffs of both departments are engaged in various research and consultative activities through which the student's graduate experience is enriched, both indirectly and directly.

The Department of Sociology operates a Social Research Consultation Service which offers to the people of the state professional assistance in meet-

ing community problems. A part of the Consultation Service is the Bureau of Community Service which provides research opportunities for graduate students interested in community analysis and development.

The Department of Rural Sociology participates in three related, though separate, parts of the University: (1) as a part of the College of Agriculture and Home Economics and of the Graduate School, it offers both undergraduate and graduate courses, (2) as a part of the Agricultural Experiment Station it carries on research in rural sociology, and (3) as a part of the Extension Service it is involved in applying the results of sociological research to the problems of rural people of the state.

101 - POVERTY AND DEPENDENCY. A study of poverty and social dependence and of measures for their alleviation and reduction, with special attention to present private and public activities in this direction, including social insurance. (3) II (Best)

102 - SOCIAL PATHOLOGY. A systematic examination of the various types of social disorganization, with particular emphasis upon the sociological explanation of underlying factors. (3) II (Kennedy)

103 - CRIMINOLOGY. A study of general conditions as to crime and delinquency, of measures of punishment and reform of offenders, of criminal procedure and its possible reform, and of measures for the prevention of crime. (3) I, II, S (Best)

104 - SOCIAL PSYCHOLOGY. (Same course as Psychology 104, Social Psychology). Description and explanation of social phenomena in terms of the original and acquired reaction systems of the individual. Topics given special attention: crowd and mob behavior, propaganda, and nationalism. (3) II (White)

105 - SOCIAL THEORY: PLATO TO COMTE. The social theories of representative social thinkers, together with a brief study of their lives and the time in which they lived. Extensive reading of their works. (3) I (Sanders)

109 - THE FAMILY. A study of the family, both in its historical aspects and in connection with modern life. (3) I, S (Gladden)

114a-d - INDEPENDENT WORK IN SOCIOLOGY. Study of some special topic by duly authorized students. (1) I, II, S (Staff)

121 - POPULATION PROBLEMS. A study of movements and trends in population, with respect to race, age, birth-rates, etc. (3) I (Sanders)

122 - CONTEMPORARY SOCIOLOGICAL THEORY. A study of the leading developments in sociological theory and methodology from Comte to the present time. (3) II (Anderson)

124 - TECHNIQUES OF SOCIAL INVESTIGATION. A study of the practical applications of sociology in organizing, conducting, and interpreting social surveys and other forms of concrete research. Some background in statistics desirable for the student. (3) I (Kennedy)

126 - INDUSTRIAL SOCIOLOGY. A sociological analysis of the division of labor, the characteristics of occupational groupings; principal socio-economic movements, and group relationships in modern industry (3) II (Gladden)

127 — SOCIAL CLASSES. A systematic treatment of the factors underlying differentiation and stratification, with particular attention to problems of caste and class; nobility in American society. (3) I (Anderson)

128 — HUMAN RESOURCES OF THE SOUTH. An intensive analysis of the population and sociological organization of the South. Consideration of the sociological factors influencing the optimum development and utilization of the human resources of this region. (3) I, S (Anderson)

130 — SOCIAL SYSTEMS. A study of the different social systems that have been proposed or attempted in human society from the earliest times to the present. (3) II (Best)

164 — THE BALKANS — THE STUDY OF A PEASANT SOCIETY. A description of the basic social structure of the Balkan region, which is predominantly rural, and an analysis of the social changes occurring in the peasant way of life. Countries covered are Albania, Bulgaria, Greece, Rumania and Yugoslavia. (3) I, S (Sanders)

170 — THE CITY. The sociology of city life. (3) II, S (Given)

201a-b — SOCIOLOGY SEMINAR. Consideration mainly of methods of research and of current sociological literature. (2) I, II, S (Staff)

209 — SEMINAR IN THE FAMILY. A seminar for advanced students interested in family research, family counseling, or dealing with family relationships in some other professional capacity. (2) (Gladden)

224 — MINORITY GROUPS. A sociological scheme of analysis is applied to the special problems of adjustment arising from ethnic group relations and culture contacts. (3) II (Best)

225 — SYSTEMATIC SOCIOLOGY. An intensive study of certain selected sociological theorists such as Weber, Durkheim, Simmel, Pareto, and others. (3) I (Sanders)

230 — PROBLEMS OF EDUCATIONAL SOCIOLOGY. (Same as Educational Sociology 230.) An advanced course in the application of sociological findings to educational programs. (3) I (Hartford)

RURAL SOCIOLOGY

115 — ORGANIZATION OF RURAL GROUPS. (3) II, S (Bauder)

125 — RURAL MOVEMENTS AND SOCIAL POLICY. (3) I

160 — RURAL COMMUNITY ANALYSIS. (3) I, II (Bauder)

180 — ADVANCED RURAL SOCIOLOGY. (3) I, S (Brown)

190a-c — SPECIAL PROBLEMS IN RURAL LIFE. (2) I, II (Staff)

220a-c — RESEARCH IN RURAL SOCIOLOGY. (2) I, II, S (Staff)

210 — SEMINAR IN RURAL ORGANIZATIONS. (3) I (Beers)

220 — SEMINAR IN RURAL ATTITUDES. (3) II (Bauder)

230 — RURAL URBAN RELATIONS. (3) I (Brown)

250 — TOPICAL SEMINAR. (3) II (Staff)

III. BIOLOGICAL SCIENCES

AGRONOMY (See Agriculture)

ANATOMY AND PHYSIOLOGY

103a-d – INDEPENDENT WORK IN ANATOMY. The pursuit of some advanced problems in anatomy under the direct supervision of the instructor. Discussion period, one hour; laboratory, four hours a week.
Prerequisite: A. & P. 10 or the equivalent. (3 each) 1, II, S (Staff)

104a-d – INDEPENDENT WORK IN PHYSIOLOGY. A study of some advanced problem in physiology under the direct supervision of the instructor. Discussion period, one hour; laboratory, four hours a week.
Prerequisites: A. & P. 10 or equivalent; (3 ea.) I, II, S (Staff)
and Chemistry 1a, b.

105 – ARCHITECTURE OF THE HUMAN SKELETON. This course is designed for the student who anticipates further advanced study in anatomy and physiology, for students of anthropology, for students in art, and for those who are preparing for the study of medicine. The study begins with the development of the skeleton joints. This is followed by the process of ossification and the histology of bones. Each bone is studied in detail; organized demonstrations are given with architecture and function being stressed. Variations in the skeleton are considered. When possible, the bone is compared with that of the lower vertebrates. The physiology of the bone, joint, and muscular relations is studied in detail. Lecture, two hours, laboratory, four hours a week.
Prerequisite: permission of the Department. (4) I, S (Allen)

106 – INTRODUCTION TO ENDOCRINOLOGY. An introductory study of the glands of internal secretion or endocrine glands in which general development, anatomical location and structure, and fundamental functions of the organs will be presented. The purpose of the course is to give a general knowledge that will be of value, not only to the student of anatomy and physiology and related subjects, but also to those of educational and sociological interest. Lecture and recitation, three hours a week.
Prerequisites: A. & P. 10 or (3) I, S (Allen and Archdeacon)
equivalent; Zoology 7b; Chemistry
1a, b; and permission of instructor.

107 – COMPARATIVE NEURO-PHYSIOLOGY. An introduction to the anatomy and physiology of the nervous system. The aim of the course is to provide an introductory laboratory course on the form, structure, and functional arrangements of the nervous system for students of biology, physiology, psychology, and those preparing for the study of medicine. The work of the course includes the careful study of the nervous systems of vertebrates. The simpler types of nervous systems are compared with that of man. The development of the various reflexes is considered. The relation of the structure of the nervous system to psychological reactions is studied. Lecture and recitation, two hours; laboratory, four hours a week.
Prerequisite: A. & P. 10 or equivalent. (4) II (Allen)

108 – CIRCULATION, RESPIRATION, AND METABOLISM. This course is a comprehensive study of the chemical and physical bases for the maintenance of respiration and circulation. It includes studies of those properties of blood which aid in the distribution of oxygen to the tissues and the maintenance of adequate circulation; the role of the heart, pulmonary circulation and systemic circulation in the maintenance of blood pressure; and the mechanisms which control blood flow to the tissues. It also involves analysis of the mechanics of respiration, gas exchange in the lungs, gas transport, the regulation of respiration, and a synopsis of the effects of oxygen lack and aviation physiology. Emphasis in this course is on the circulation and respiration of the higher mammals. Lecture, two hours; laboratory, two hours a week.
Prerequisite: A. & P. 10 or equivalent. (3) II, S (Archdeacon)

109 – CELLULAR PHYSIOLOGY. This course is designed as a more intensive study of general physiological principles. Special emphasis is placed on the chemistry and physics of the cell. The topics of study include the chemical and physical properties of protoplasm, membrane permeability, food requirements, enzyme systems, irritability and conduction, cell movement, environmental factors, tropisms, and cell senescence. Lecture, two hours; laboratory, two hours a week.
Prerequisites: A. & P. 10 or equivalent; (3) II, S (Boyarsky)
Physics; and General Chemistry.

110 – INTERMEDIATE METABOLISM. The energy aspects of metabolism are emphasized in this course. The student is introduced to methods of determining body and tissue metabolism. A detailed study of the intermediate metabolism of carbohydrates, proteins, and fats is made. The role of vitamins in oxidation-reduction enzyme systems is considered. Lecture, two hours; laboratory, two hours a week.
Prerequisites: A. & P. 10 or equivalent; (3) I, S (Archdeacon)
Physics; and Organic Chemistry.

201a-i – RESEARCH IN PHYSIOLOGY. The pursuit of an assigned problem in which the student will have the opportunity to demonstrate his or her originality. Conference and laboratory six hours a week.
Prerequisites: A. & P. 10 or equivalent; (3 ea.) I, II, S (Allen, Archdeacon and Boyarsky)
Chemistry 130a, b,
or the equivalent; Physical
Chemistry desirable; and Physics, one year.

202 – PHYSIOLOGICAL TECHNIQUES. This course is intended to offer the student training in some techniques used in physiological research. Operational procedures, such as are used in gastrointestinal, hemodynamic, and respiratory physiology are undertaken. Training is provided for the performance of procedures under aseptic conditions. Laboratory, four hours a week.
Prerequisite: A. & P. 10 or equivalent. (2) I, II (Archdeacon)

203 – EXPERIMENTAL ENDOCRINOLOGY. Abnormalities of the various endocrine glands are produced experimentally. The results therefrom are very closely followed and recorded in thorough reports which are handed in to the instructor upon the completion of each case. Laboratory, four hours a week.

Prerequisite: A. & P. 106. (2) I, II (Allen)

204 — GRADUATE SEMINAR IN ANATOMY AND PHYSIOLOGY. Required of all graduate students. Discussion period, one hour a week.
(1) I, II (Staff)

ANIMAL INDUSTRY (See Agriculture)

ANIMAL PATHOLOGY (See Agriculture)

ANTHROPOLOGY (See Social Sciences)

BACTERIOLOGY

102 — GENERAL BACTERIOLOGY. Observation and cultivation of bacteria and related microorganisms; study of their morphology, classification, physiology, relation to certain fermentations, to food, to soil fertility, and to disease. Lectures and recitations, two hours; laboratory, four hours a week.
Prerequisite: Chemistry 1b. (4) I, II, S (Scherago and others)

103 — PATHOGENIC BACTERIOLOGY. A study of human and animal pathogenic microorganisms, especially their morphological, cultural, and pathogenic properties. Lectures and recitations, two hours; laboratory, four hours a week.
Prerequisites: Bacteriology 102 or 52, (4) I, S (Scherago or Humphries) or 2b; and Chemistry 1b.

104 — APPLIED BACTERIOLOGY. A course in bacteriological analysis to supplement courses 52 and 102. Laboratory, four hours a week.
Prerequisite or concurrent: Bacteriology 102 (2) I, II, S (Hotchkiss or 52, or 2b; and Chemistry 1b. and others)

110a — LABORATORY DIAGNOSIS. Laboratory methods employed in diagnostic and public health laboratories. Designed primarily for medical technology students. Examination of sputum, urine, and blood. Laboratory, six hours a week.
Prerequisite or concurrent: Bacteriology 103. (3) I, S (Hotchkiss)

110b — LABORATORY DIAGNOSIS. Continuation of 110a. Laboratory diagnosis of parasitism; examination of stomach and intestinal contents; laboratory methods used in diagnosis of gonorrhea, typhoid fever, diphtheria, syphilis, etc. Laboratory, six hours a week.
Prerequisite or concurrent: Bacteriology 125. (3) II, S (Hotchkiss)

111 — GENERAL PATHOLOGY. The effects of disease on the organs and tissues of the human body will be studied at autopsies and by examination of fresh and museum specimens as well as histological sections. Degenerations, infiltrations, regenerations, inflammations, disturbances of the circulation, infectious granulomata, neoplasms, etc., will be studied. Lectures and recitations, two hours; laboratory, four hours a week.
Prerequisites: Anatomy and Physiology 10; (4) I, S (Maxwell, Scherago, Zoology 7b, 101b, and 106; Bacteriology and Hotchkiss) 103; and permission of head of department.

115a-f — INDEPENDENT WORK. Students will be assigned special problems in laboratory work and reference reading. Laboratory, six hours a week.
Prerequisite: any Bacteriology course above 2b. (3 ea.) I, II, S (Staff)

120a-b – HOSPITAL LABORATORY PRACTICE. Students will be required to carry out, under supervision, the laboratory work in one of the hospitals in Lexington. Laboratory, twelve hours, and eighteen hours, respectively a week.

Prerequisites: Bacteriology 110a, b; (4, 6) I, II, S (Maxwell,
permission of head of department. Harrison, and others)

125 – IMMUNOLOGY AND SEROLOGY. The theories and mechanism of infection and immunity; the preparation, standardization, and uses of vaccines, toxins, anti-bodies, and other biological products related to the diagnosis, prevention, and treatment of specific infectious diseases; agglutination; complement fixation, etc.; antigenic analysis; serology of syphilis; hypersensitiveness. Lectures and recitations, two hours; laboratory, six hours a week.

Prerequisite: Bacteriology 103. (5) II (Scherago and Humphries)

201a-f – RESEARCH IN BACTERIOLOGY. Laboratory, ten hours a week. (5) I, II, S (Senior Staff)

203a – PUBLIC HEALTH BACTERIOLOGY. This course considers the public health aspects of bacteriology including the etiology, epidemiology, immunology, and laboratory diagnosis of infectious diseases; the bacteriology of air, water and sewage; food poisoning, the production, standardization, and practical applications of biological products used in the diagnosis, treatment, and prevention of infectious diseases; the standardization of disinfectants. Lectures and recitations, one hour; laboratory, four hours a week.

Prerequisites: open only to physicians and health (3) I, S (Scherago
officers or those with equivalent training. and others)

203b – PUBLIC HEALTH BACTERIOLOGY. Continuation of 203a. Lectures and recitations, one hour; laboratory, four hours a week.

Prerequisite: Bacteriology 203a. (3) II, S (Scherago and others)

206 – BACTERIOLOGY OF FOODS. Microbiology of milk and milk products. Standard methods of bacterial analysis as used in official food and public health laboratories. Lectures and recitations, two hours; laboratory, four hours a week.

Prerequisites: Bacteriology 2b, (4) II, S (Weaver and Hardin)
or 52, or 102, and Chemistry 21b.

207 – BACTERIOLOGY OF WATER AND SEWAGE. The microflora of water; importance of the colon-typhoid group of bacteria in water; methods of water analysis and interpretation of results; special media in isolating and identifying the colon-typhoid group of bacteria; methods of water purification; microflora of sewage; methods of sewage analysis; methods of sewage disposal; bacteriological study of swimming pools, methods of analysis; effect of treatment on bacteriological content, regulations concerning swimming pools. Water purification plants, sewage disposal plants and swimming pools will be visited and studied. Lectures and recitations, two hours; laboratory, four hours a week.

Prerequisites: Bacteriology 2b, or (4) II, S (Weaver and Hardin)
52, or 102; and Chemistry 21b.

210 – CLINICAL MYCOLOGY. A study of the patho-physiology of human and animal fungus infections. Methods and techniques for isolating and propagating pathogenic actinomycetes and fungi. Laboratory diagnosis of fungous infections. Laboratory, four hours a week.

Prerequisites: Chemistry 130b; reading (2) I, S (Hotchkiss)
knowledge of one foreign language.

Prerequisite or concurrent: Bacteriology 125.

220 — HISTORY OF BACTERIOLOGY. Conferences, two hours a week.
Prerequisite: Bacteriology 125. (2) I, S (Weaver)

222 — ADVANCED GENERAL BACTERIOLOGY. A study of bacterial morphology and life cycles; theories of staining; techniques of study. A study of the problems of identification and classification of bacteria; principles of naming and classifying bacteria; bacterial variation; role of serological procedures in identification and classification. Lectures and conferences, two hours; laboratory, four hours a week.
Prerequisites: Bacteriology 125; and Chemistry 130c. (4) II, S (Weaver)

224 — DISINFECTANTS AND ANTIBIOTICS. A study of the chemical agents injurious to micro-organisms including modes of action, practical applications and methods of testing. Conferences, one hour; laboratory four hours a week.
Prerequisites: Bacteriology 2b, or 52 and 104; and Chemistry 130b. (3) II, S (Hotchkiss)

226a — METABOLISM OF MICROORGANISMS. A study of the chemical changes produced by bacteria, yeasts, and molds; of the properties of their enzymes; of the physiology of their growth, and of their growth requirements. Lectures or conferences, two hours; laboratory, four hours a week.
Prerequisites: Chemistry 130b and a reading knowledge of German or French; and Physical Chemistry recommended. (4) I, S (Hardin)

226b — METABOLISM OF MICROORGANISMS. Continuation of 226a. Lectures or conferences, two hours; laboratory, four hours a week.
Prerequisite: Bacteriology 226a. (4) II, S (Hardin)

235 — IMMUNOCHEMISTRY AND ADVANCED IMMUNOLOGY. The chemistry of antigens and of antibodies and the reaction between them in vitro and in vivo; immune and hypersensitive cellular reactions. Lectures and conferences, two hours; laboratory, four hours a week.
Prerequisites: Bacteriology 125b; and Chemistry 130b and 143b. (4) II, S (Scherago or Humphries)

250a-f — SEMINAR. Review of current literature in bacteriology; presentation of papers on work in progress in the department or on assigned topics; reports on meetings of national bacteriological societies. Required of all graduate students. Two hours a week.
 (1 ea.) I, II, S (Staff)

270 — ELECTRON MICROSCOPY. A study of electron microscopy, with major emphasis upon the operation and uses of the magnetic electron microscope and the vacuum unit for metal evaporation, including methods of sample preparation and the technic of shadow casting. Applications in biological and physical sciences will be studied. Lecture, one hour; laboratory, four hours a week.
Prerequisites: Physics 3a, b; and permission of instructor. (3) I, S (Edwards)

272 — VIRUSES AND RICKETTSIAE. A study of the natures, activities and methods of laboratory cultivation of viruses and rickettsiae and of their relation to bacteria, plants and animals. Lectures, two hours; laboratory, four hours.
Prerequisite: Bacteriology 125. (4) II, S (Edwards)

BOTANY

103a — PLANT PHYSIOLOGY. Cellular physiology with emphasis upon the nature of protoplasm, inclusions, and solutes; cell structure, permeability, thermal and chemical lability of contents; colloids, nature of colloidal systems, their importance and behavior. Photosynthesis; steps in the process, function of chlorophyll, and stomata; essential factors, regulatory factors. Chemosynthesis by non-green plants. Absorption, transpiration and translocation of water; absorption, translocation, and metabolism of solutes. Lecture, two hours; laboratory, four hours per week.

Prerequisites: 6 semester hours of botany; organic chemistry and physics recommended.

(4) I

103b — PLANT PHYSIOLOGY. A continuation of 103a; hydrolase enzymes, their characteristics and effects; respiration, theories of carbohydrate oxidation in vivo, the relation of pigments and oxidizing-reducing enzymes to the process, respiratory substrates in both aerobic and anaerobic phases. Growth; essential physical and physiological factors, role of phytohormones and other formative factors. Movements, irritability, and response to stimuli. Dormancy in plant organs and the mechanism of control. Maturation, senescence, and death. Lecture, 2 hours; laboratory, four hours per week.

Prerequisite: Botany 103a.

(4) II

106a-c — SPECIAL PROBLEMS. Independent work in some phase of advanced botany.

Prerequisite: 18 semester hours of courses in botany not open to freshmen.

(3) I, II (Staff)

107 — MORPHOLOGY OF ALGAE. The economic value of algae and the structure and life histories of representative forms of the various groups. Laboratory, six hours.

Prerequisite: 6 semester hours of botany.

(3) I (McInteer)

114 — ECOLOGY. The relationships existing between plants and their various environments; plant succession, plant associations and formations; the principles of plant geography; the vegetation of North America. Lecture, three hours; laboratory, two hours.

Prerequisite: 6 semester hours of botany.

(4) II (McInteer)

115a, b — SEMINAR. Assigned readings and reports on special topics. One hour per week. Required of all graduate and under-graduate majors.

(1) I, II (Staff)

125a — MORPHOLOGY OF THE FUNGI. A comprehensive study of many typical forms of the Myxomycetes, Phycomycetes, and a few of the Ascomycetes; their structure, method of reproduction, and classification. Lecture, two hours; laboratory, four hours.

Prerequisite: Botany 2 or equivalent.

(4) I (McFarland)

125b — MORPHOLOGY OF THE FUNGI — A continuation of 125a. The remainder of the Ascomycetes, the Basidiomycetes, and the Fungi Imperfecti. Lecture, two hours; laboratory, four hours.

Prerequisite: Botany 125a.

(4) II (McFarland)

130 — INTRODUCTION TO HEREDITY. Chromosomal cytology and its importance in heredity. Cell division; gametogenesis and sporogenesis; meiosis and its relation to life cycles; the structure of chromosomes; genes,

their distribution to succeeding generations, their action and interaction; gene mutation and its importance in evolution. Not open to students who have had Botany 104.

Prerequisite: 6 semester hours in the biological sciences. (3) I, II, S (Riley)

132 — GENES AND THEIR ACTION. The nature, action, and interaction of genes and the relation of the gene to the developed character; mutation, multiple alleles, epistasis, polymery. Lecture, two hours; laboratory, two hours.

Prerequisite: Botany 30 or 130 or equivalent. (3) I (Riley)

134 — CYTOGENETICS. Chromosome aberrations and their importance in heredity and in evolution. Intrachromosomal aberrations; aneuploids; autopolyploids; allopolyploids; speciation; isolating mechanisms; hybrid swarms; introgressive hybridization. Lecture, three hours; laboratory, two hours.

Prerequisite: Botany 30 or equivalent. (4) II (Riley)

135 — PLANT CYTOTAXONOMY. Cytogenetic, geographical, and other factors that have influenced the origin and development of new species and that have aided in clarifying difficult taxonomic problems in various families of plants. Lecture, three hours, or three student reports per week.

Prerequisites: Botany 15 and 34 or equivalents. (3) I (Riley)

150a — ADVANCED SYSTEMATIC BOTANY. For those students who have completed Botany 15 or its equivalent and who wish to continue with identification. The student will be expected to identify many more and more difficult specimens than in Botany 15. A comprehensive survey of the different methods of classification will be required of each student. Lecture, one hour; laboratory, four hours.

Prerequisite: Botany 15 or equivalent. (3) I (McFarland)

150b — ADVANCED SYSTEMATIC BOTANY. A continuation of Botany 150a. Lecture, one hour; laboratory, four hours.

Prerequisite: Botany 150a. (3) II (McFarland)

160 — PLANT MICROTECHNIQUE. The principal methods used in the preparation of permanent slides for the compound microscope. Not open to students who have had Botany 6. Laboratory, nine hours.

Prerequisites: 6 semester hours of botany. (3) II (McFarland)

170a — ADVANCED PLANT PHYSIOLOGY. A course designed to acquaint the student with the literature of the subject, advanced theories and data, and new techniques. Particular emphasis placed upon recent advancements in the fields of mineral nutrition, growth and development. Lecture, three hours, or three student reports per week.

Prerequisites: Botany 103a, b or the equivalents. (3) I, S

170b — ADVANCED PLANT PHYSIOLOGY. A continuation of 170a, although each course may be taken independently. Primarily designed as a method or technique course covering sampling methods, culture methods, physical and chemical analytical procedures, the use of physiological equipment in the laboratory and greenhouse. Lectures or conferences, two hours; laboratory, four hours per week.

Prerequisites: Botany 103a, b or their equivalents; organic chemistry, physical chemistry and physics recommended. (4) II

206a, b — RESEARCH IN PLANT MORPHOLOGY. Graduate students prepared for independent work will be assigned to investigations in anatomy, histology, or special morphology of plants. (4) (McFarland)

207a, b — RESEARCH IN MYCOLOGY. Those desiring to carry on investigations in mycology should have had Botany 125b or the equivalent. Suitable work will be suggested to students desiring to enter this field. *Prerequisite: Botany 125b or equivalent.* (4) (McFarland)

210a, b — RESEARCH IN PLANT PHYSIOLOGY. Graduate students with adequate preparation in plant physiology, physics, and chemistry may carry on independent investigations in plant physiology. (4)

213a, b — RESEARCH IN SYSTEMATIC BOTANY. Any student who has shown ability and initiative in Botany 150a and b or its equivalent and who is working on an advanced degree may be assigned to this course. The student may elect to work on the flora of the county in which he lives or of some local region or he may be assigned to work up some order or family of plants. A student may elect this course in the preparation of his collection which is to be incorporated in his thesis. *Prerequisite: Botany 150b.* (4) (McFarland)

215a, b — RESEARCH IN CYTOGENETICS. Independent investigations in the field of cytogenetics. In connection with his investigations, the student will be expected to master the literature of his problem and present it in a report. (4) (Riley)

ENTOMOLOGY (See Agriculture)

HORTICULTURE (See Agriculture)

HYGIENE AND PUBLIC HEALTH

100a — PUBLIC HEALTH. A consideration of the cause, prevalence, transmission and control of preventable diseases. (3) I, S (Heinz and Hamilton)

100b — PUBLIC HEALTH. A continuation of 100a. Environmental and organization approach to disease prevention. (3) II, S (Heinz and Hamilton)

104 — MATERNAL AND CHILD HEALTH. Problems in maternal and child health. (2) II, S (Heinz)

110 — HEALTH EDUCATION. A course dealing with principles of health education, and the cooperative nature of school health work through study of problems in the solution of which contributions are made by parents, school and community. (3) II, S (Heinz)

111a-d — INDEPENDENT WORK IN HYGIENE AND PUBLIC HEALTH. (3) I, II, S (Heinz)

115 — COMMUNICABLE DISEASES. A study of communicable diseases with reference to causal agents, transmission, and their methods of prevention and control. (3) II, S (Hamilton)

118 — VITAL STATISTICS. Statistics of population, deaths, births and morbidity; the collection and analysis of vital statistics. (3) I, S (Heinz)

120a — MENTAL HYGIENE. An introduction to mental hygiene including a consideration of the cause, treatment and prevention of mental disorders. (3) I, S

120b — MENTAL HYGIENE. A continuation of Hygiene 120a. Students are given the opportunity to apply to concrete cases the principles and concepts developed in 120a. (3) II, S

122 — SCHOOL AND COMMUNITY HEALTH. To develop an idea of the cooperative nature of school health work and the importance of connecting it with adult work in the community. (2) I, S (Heinz)

150a, b — PROBLEMS IN HEALTH EDUCATION. An individual problems course for students and teachers in service, based upon a systematic attack upon the health problems of a school. (2) II, S (Heinz)

PHARMACY (See Biological Sciences)

PSYCHOLOGY

The Department of Psychology offers graduate training in clinical psychology, in industrial psychology, and in general and experimental psychology.

In cooperation with the Veterans Administration, the Department of Psychology has set up a program of training in clinical psychology of four years duration leading to the degree of Doctor of Philosophy. The students who are being trained in this program are appointed as part-time psychological interns at the local Veterans Administration Hospital. The training program is described in Technical Bulletin 10A-146 of the Veterans Administration. Prospective applicants for internships should write to the Head of the Department.

Practical experience through contact with actual cases of psychoses, psychoneuroses, mental deficiency, maladjustments in children and adults, and other behavior problems is available in several nearby institutions.

The Department is affiliated with the University Personnel Office. The records of scores obtained by students on various tests of intelligence, aptitudes, and achievement are available to graduate students who wish to do research on problems of student personnel.

The Department cooperates in the operation of the Child Guidance Service.

The Department offers to industries and business establishments an industrial psychological service, which includes various forms of testing, personnel surveys, selection devices, and advice on miscellaneous problems of personnel. Students who are interested in industrial personnel work have opportunities to obtain practical experience and to do research in this field leading to the doctorate.

A laboratory for the study of animal behavior is provided and equipped for research and class work on white rats and other lower animals.

104 — SOCIAL PSYCHOLOGY. Description and explanation of social phenomena in terms of the original and acquired reaction systems of the individual. So-called types are characterized in respect to the social problems they

present. Topics given special consideration: crowds, mob behavior, propaganda, and nationalism.

Prerequisite: Psychology 1.

(3) I, II (White)

105 – EMPLOYMENT PSYCHOLOGY. Emphasis is placed on the characteristics of an effective interview, the significance of certain items in the application blank, the use of objective tests in selections, and the relation of adjustment, interests, special abilities, and experience to job fitness. Opportunities are provided for practice in interviewing and evaluating essential information in employment work. Three hours of lecture, two hours of laboratory a week.

Prerequisite: Psychology 1 or equivalent.

(3) II (Mellenbruch)

106 – INDUSTRIAL PSYCHOLOGY. Applications of psychology to industrial personnel problems: training and upgrading of employees, merit ratings, factors involved in industrial fatigue, surveys of attitudes, improvement of morals, reduction of turnover and absenteeism, safety promotion, providing incentives, welfare provisions, etc. Opportunities are provided for observation of successful methods in use in industrial situations.

Prerequisite: Psychology 1 or equivalent.

(3) II (Mellenbruch)

108 – EXPERIMENTAL PSYCHOLOGY. An experimental study of the nature of sensation and perception – of the entire process by which we know the world through our senses. Chief topics are: methods of measuring sensory thresholds; the skin; senses; taste and smell; vision; hearing; attention; association. Two hours lecture, four hours laboratory.

Prerequisite: Psychology 1.

(4) I (Meyers)

113 – PSYCHOLOGY OF LEARNING. An experimental study of the learning process with an analysis of various types of learning. Experiments and lectures are based on the various forms of learning – verbal learning, form learning, conditioned response learning, acquisition of skills, memory, problem solving, and thinking. Two hours lecture, four hours laboratory.

Prerequisite: Psychology 1.

(4) II (Calvin)

114 – ABNORMAL PSYCHOLOGY. An intensive course on disturbed conduct and thinking studied from both the theoretical and the practical points of view. The major psychoses and neuroses are given special consideration.

Prerequisite: Psychology 1.

(3) II (Pattie)

115 – GENETIC PSYCHOLOGY. Influence of hereditary factors in the development of human behavior, with a critical survey of the problem and the evidence in connection with certain psychological traits such as musical and other special abilities, intelligence, insanity, and interests.

Prerequisite: Psychology 1.

(3) I (Newbury)

116 – ANIMAL BEHAVIOR. A survey of the field of animal behavior with special reference to experimental technique. Opportunity for research experience in an animal laboratory. Topics include: problems of heredity and environment, activity, instinct, motivation, learning, sensory discrimination, and personality in sub-human species. Relationships to human problems are indicated. Three hours of lecture, two hours of laboratory a week.

Prerequisite: Psychology 1.

(4) II (Newbury)

117 – BIOLOGY OF MOTIVATION. Fundamental activating and goal-seeking processes of living organisms, biologically considered, including experimental and theoretical studies on such topics as instincts, drives, motives, appetites, and taste preferences.

Prerequisite: Psychology 1.

(2) S (Newbury)

120a-d — INDEPENDENT WORK IN PSYCHOLOGY. Designed for advanced students and graduates who undertake minor research problems to be conducted in regular consultation with the instructor. A minimum of six hours a week is required.

Prerequisite: major in the Department with a standing of 2.0 in psychology courses. (2 ea.) I, II, S (Staff)

121 — STUDENT PERSONNEL. The methods of dealing with student personnel problems in college and high school, including the problems of selection, classification, sectioning of classes, grading, personal adjustment, motivation, guidance, and vocational placement. The functions of a personnel officer in schools and colleges.

Prerequisite: Psychology 1. (3) I (Martin)

124 — MENTAL HYGIENE. The objective of the course is to give a general orientation to the subject of mental hygiene, its historical development, its scope and relation to various sciences. The individual and cultural determinants of behavior will be discussed. Not available for credit to students who have had Hygiene 120a. The courses are taught at the same time, and the student may take the course either as Hygiene or Psychology.

Prerequisite: Psychology 1. (3) I (Bills)

125 — EXPERIMENTAL CHILD STUDY. An advanced course in the psychology of the normal child. The scientific background of experimental and observational method. Opportunities are provided to work with children in the University Nursery School and Elementary School.

Prerequisite: Psychology 7. (3) II (Humphreys)

130 — SPEECH PATHOLOGY: A SURVEY. The nature, causes, and treatment of the major disorders of speech: defective articulation and voice, aphasia, and stuttering. Some reference will be made to organic disabilities affecting speech. Stuttering is not stressed. A limited amount of clinical practice may be obtained by some of the more advanced students.

Prerequisite: 9 semester credits of psychology or educational psychology. (3) S (Diehl)

131 — STUTTERING AND ITS CORRECTION. The nature, causes, and treatment of stuttering, with emphasis on therapeutic methods. This course will provide more material from the field of mental hygiene than Psychology 130. Supervised clinical work may be done by students in this course who show that they are ready for it.

Prerequisite: 9 semester credits of psychology or educational psychology. (3) S (Diehl)

201a — SEMINAR IN PSYCHOLOGY. One two-hour discussion each week of a research problem under investigation by a graduate student or staff member.

(1) I, II (Staff)

201b, c, etc. — SEMINAR IN PSYCHOLOGY. Continuation of 201a. These numbers are provided for registration in succeeding semesters.

(1) I, II (Staff)

203a — PROBLEMS IN PSYCHOLOGY. Shorter research problems are registered under this number. A minimum of six hours per week is required in consultation with the instructor.

(2) I, II, S (Staff)

203b, c, etc. — PROBLEMS IN PSYCHOLOGY. Continuation of research. These numbers are provided for registration in subsequent semesters.

(2) I, II, S (Staff)

210a — RESEARCH IN PSYCHOLOGY. A minimum of nine hours per week is required on research conducted in consultation with the instructor.

(3) I, II, S (Staff)

210b, c, etc. — RESEARCH IN PSYCHOLOGY. Continuation of research. These numbers are provided for registration in succeeding semesters.

(3) I, II, S (Staff)

211 — MENTAL WORK AND FATIGUE. A laboratory course. Two hours devoted to experiments and two hours discussion each week.

Prerequisites: an advanced course in experimental psychology and elementary statistics, or equivalent.

(3) I (Calvin)

212 — THE EMOTIONS. An experimental study of feeling and emotion. Topics covered include development of emotional behavior, facial and body expressions of emotion, emotion as conscious experience, neurological and physiological mechanisms involved in emotional behavior, theories of emotion, and experimental techniques for investigating emotional behavior. Two hours lecture, two hours laboratory.

Prerequisite: Psychology 109 or equivalent.

(3) II (Calvin)

214 — THEORIES OF LEARNING. An examination of theories which attempts to explain the processes of learning and memory. The principal types of theories examined are the behavior theories and the field theories; other views are discussed as variations of these. Theories are evaluated in terms of their capacity to explain existing experimental data and to predict outcomes where no experimental observations have been made.

Prerequisite: Psychology 113 or equivalent.

(3) II (Calvin)

215 — PSYCHOMETRICS. An advanced course which considers the treatment and interpretation of human measurements. The course deals with the computation and interpretation of simple, partial, and multiple correlations, regression equations, and reliability of measures.

Prerequisite: Mathematics 24 or equivalent.

(3) II (Glaser)

217 — PSYCHOLOGY OF LANGUAGE. A survey of experimental and clinical findings in regard to the language function in the child, adult, primitive peoples, mentally disordered, and brain-injured cases. A framework for a developmental and comparative approach to language problems is developed and the relation of language to the general problems of concept formation and symbolism is examined.

(2) II (Humphreys)

219 — CLINICAL PSYCHOLOGY. A survey of clinical work on the diagnosis and adjustment of problem children and adults. The course gives practical training and experience with representative cases.

(4) I, II, S (Humphreys)

222 — SYSTEMS OF PSYCHOLOGY AND THEIR HISTORY. A survey of the history of psychology and an intensive study of current systems of psychology.

(3) I (Pattie)

225 – PRACTICE IN TESTING: INTELLIGENCE TESTS. This course provides advanced laboratory practice in the measurement of intelligence by individual techniques. Six hours a week.
Prerequisite: Psychology 8 or equivalent. (3) I, II (Glaser)

226 – PSYCHOLOGICAL MEASURING INSTRUMENTS. A study is made of a wide variety of psychological tests designed for school surveys, counseling and employee selection and placement. Instruments covered include group intelligence tests, personality and interest inventories, area aptitude tests, and special aptitude tests. Attention is given to the structure, validation evidence, and uses of the various tests and inventories.

(3) II (Mellenbruch)

230 – PERSONALITY THEORY. An intensive survey of the major psychiatric, psychological, and sociological theories of personality structure and development. The relation of these theories to psychological research on personality, accomplished and potential, and personality theory underlying the major clinical testing techniques will be examined. (3) I (Humphreys)

234a – PRINCIPLES OF TEST CONSTRUCTION. A survey of the principles involved in different types of standardized tests, followed by the construction of an original test by the student. This test is administered by the student to an adequate sampling of the appropriate population group. The student then makes an item analysis and other evaluations of the content of the preliminary form of his test. Recommended for those preparing for personnel administration and research in business and industry.
Prerequisite: Psychology 215. (3) I (Mellenbruch)

234b – TEST STANDARDIZATION. A continuation of 234a. The student will administer a revised form of his preliminary test, as prepared in Psychology 234a, to an adequate sampling of the population and will utilize all pertinent statistical techniques in determining the reliability, validity, and other characteristics of his test.
Prerequisite: Psychology 234a. (3) II (Mellenbruch)

235 – DIAGNOSIS AND COUNSELING IN A STUDENT PERSONNEL PROGRAM. An advanced course requiring recent background in both psychological measurement and the principles of guidance. It lay stress on skill in interpreting diagnostic material rather than on theory. Attention is given to techniques for collecting information regarding the student, the making of a diagnosis, and the techniques of counseling and interviewing.
Prerequisites: a graduate major in psychology or education; and Psychology 121. (3) II (Croft)

237 – CLINICAL TESTING. Provides the student with extensive experience in the use of clinical diagnostic techniques with a variety of pathological subjects at different age levels. Emphasis will be placed upon the critical analysis and evaluation of the patients' test performances. Special consideration will be given such matters as: item analysis of subtests, patterns of scatter, and differential diagnostic value of characteristic patterns. In the interpretation of test results, a major emphasis will be placed upon the interrelations existing in respect to the total picture presented by the patient as these become meaningfully correlated with the data of the social history, the medical history, and the psychiatric study. Six hours a week.
Prerequisite: Psychology 101. (2) I, II (Watson)

238 — THE RORSCHACH TEST. The purpose of this course is to introduce the student to the Rorschach test as a clinical instrument. The course provides for practice in administering, scoring, and interpreting the test data derived from a diversity of normal and pathological subjects. Emphasis is placed upon the integration of the Rorschach data with those derived from other sources and its particular value in delineating the effective and conative factors of the personality as these play a dynamic role in the individual's competence in handling his reality relationships.

Prerequisite: Psychology 219.

(4) I, II (Dimmick)

239 — THE THEMATIC APPERCEPTION TEST. This course introduces the student to the Thematic Apperception Test as a clinical diagnostic procedure of primary importance in obtaining a picture of the actual thought content, attitudes, and feelings of the patient. Thus the data obtained serve to supplement and fill in the personality framework etched in outline by the intelligence, concept formation, impairment and/or deterioration, etc. The course will provide practice in administering, scoring, and interpreting data from normal and pathological subjects.

Prerequisite: Psychology 238.

(3) II, S (Roseman)

240a — THERAPEUTIC PROCEDURES. A course in the theory, technique, and application of nondirective psychotherapy. Consideration will be given to the personality theory formulated for the technique and experimental evidence supporting the theory and practice will be examined. Opportunity will be offered to study cases handled with the technique, and to listen to recorded cases, and to engage in supervised experience.

(3) I (Bills)

240b — THERAPEUTIC PROCEDURES. This course will present the history, evolution, and rationale of a wide range of interrelated therapeutic procedures. These will be discussed in respect to their indications and contraindications. Emphasis will be placed upon direct therapy, but supportive and indirect therapy will be accorded consideration. Demonstrations of selected therapeutic procedures will be provided, and the student will be given supervised experience in respect to: (1) directive psychotherapy (interview), (2) play therapy, and (3) use of painting and drawing.

Prerequisite: Psychology 239.

(3) II (Dimmick)

241 — MOTIVATION. This course will survey our present knowledge, clinical, experimental, and observational, in respect to the affective and conative factors in psychopathological reactions. In this course our interest will center predominantly in the dynamics of human behavior as elaborated in the psychology of Freud and the psychoanalytic school.

(2) I, S (Dimmick)

245 — ADVANCED ABNORMAL PSYCHOLOGY. An advanced course intended primarily for clinical psychologists. Special consideration is given the neuroses and the psychoses. Emphasis is placed upon the problems of differential diagnosis through the use of psychological techniques.

Prerequisites: a master's degree in psychology or equivalent training; and permission of instructor.

(3) II (Dimmick)

250 — THE RORSCHACH TEST. Advanced course. In this course emphasis will be placed on the interpretation of a wide range of normal and pathological Rorschach records.

Prerequisite: Psychology 238.

(4) II (Dimmick)

270 — PSYCHOLOGICAL EXPERIMENTATION. A study of the application of experimental methods in the major areas of psychology, including sensation and perception, learning, motivation, emotion, and personality. The design of research studies will be emphasized. Each student will be required to design, execute, and prepare a written report for a research problem.
Prerequisites: Psychology 108 and 113. (3) I, II (Calvin and Glaser)

300a — MEDICAL THERAPEUTIC PROCEDURE. This course presents the rationale, indications, procedures, and results of four important psychiatric-therapeutic methods: (1) electrical and pharmacological shock, (2) narco-hypnosis or drug-analytic methods, (3) malaria and other types of fever therapy, and (4) prefrontal lobotomy. Opportunity for a demonstration of these procedures will be provided, and this will be followed by a discussion and interpretation of the results in the light of the total personality picture presented by the patient. (1) I (Straus)

300b — MEDICAL THERAPEUTIC PROCEDURE. This course presents the history, rationale, indications, procedures, and results of psychotherapeutic methods. (1) II (Straus)

310a — PRACTICUM AT EASTERN STATE HOSPITAL. Nine hours of supervised work each week. (3) I, II (Staff)

310b, c, etc. — PRACTICUM AT EASTERN STATE HOSPITAL. Continuation of 310a. These numbers are provided for registration in succeeding semesters. (3) I, II (Staff)

311a — PRACTICUM IN THE UNIVERSITY PERSONNEL OFFICE. Nine hours of supervised work each week. (3) I, II (Croft)

311b, c, etc. — PRACTICUM IN THE UNIVERSITY PERSONNEL OFFICE. Continuation of 311a. These numbers are provided for registration in succeeding semesters. (3) I, II (Croft)

312a — PRACTICUM IN CHILD PSYCHOLOGY. Nine hours of supervised work each week. (3) I, II (Humphreys)

312b, c, etc. — PRACTICUM IN CHILD PSYCHOLOGY. Continuation of 312a. These numbers are provided for registration in succeeding semesters. (3) I, II (Humphreys)

313a — PRACTICUM IN INDUSTRIAL PSYCHOLOGY. Nine hours of supervised work each week. (3) I, II (Mellenbruch)

313b, c — PRACTICUM IN INDUSTRIAL PSYCHOLOGY. Continuation of 313a. These numbers are provided for registration in succeeding semesters. (3) I, II (Mellenbruch)

431a-p — SPECIAL FIELD PRACTICUM. An intensive course in field work for students working toward the doctorate with a major in clinical psychology. Minimum of twenty hours a week. Laboratory fee \$120 a semester, \$60 for the summer session. (1) I, II, S (Dimmick)

500-1 — THESIS.

500-2 — THESIS.

500-3 — THESIS.

ZOOLOGY

101a – HISTOLOGY. Histology of the tissues. A course in the technique of the preparation of animal tissues for microscopic study. Practice in imbedding, staining, sectioning, mounting, and identification of tissues.

Prerequisite: Zoology 1.

(3) I, S (Brauer and others)

101b – HISTOLOGY. (Organology). Histology of the organs. A continuation of 101a in which the studies are based on the organs and special attention given to pathology.

Prerequisite: Zoology 101a.

(3) II, S (Brauer and others)

102 – ORNITHOLOGY. A study of the life histories, anatomy, physiology, field identification of birds, with particular reference to the habits, songs, nests, migration, and economic importance of our native birds. Lecture, recitation, laboratory, and field work.

(4) II, S (Allen)

105 – PARASITOLOGY. Designed especially for premedical, pre-veterinarian, medical technology and public health students, also the non-professional student. Protozoan, helminth and arthropod parasites of man and domestic animals, with emphasis on life histories, epidemiology, methods of diagnosis and control. Technique of host examination. Preparation of material for study.

Prerequisite: Zoology 1.

(4) I, S (Edney)

106 – EMBRYOLOGY. Development of the individual (ontogeny). Studies in maturation of germ cells, fertilization, organization of the egg, individuation, and organogenesis. Laboratory work based on the chick and the pig.

Prerequisites: Zoology 1 and 101a.

(4) II, S (Brauer)

108a – PRINCIPLES OF ZOOLOGY. (Evolution). An advanced lecture course on the fundamental principles of biology. The first semester is devoted primarily to the study of organic evolution. Three times a week.

(2) I, S (Allen)

108b – PRINCIPLES OF ZOOLOGY. (Heredity). A continuation of 108a. The second semester is devoted to the study of heredity and eugenics. Three times a week.

Prerequisite: Zoology 1.

(3) II, S (Sawyer)

109 – ANIMAL ECOLOGY AND FIELD BIOLOGY. The animal and its environment; animal communities and interrelationships, feeding, locomotor and respiratory mechanisms; populations, adaptations for living in certain habitats; modes of reproduction, protection, animal homes.

Prerequisite: Zoology 1.

(3) I (Allen)

110a-d – INDEPENDENT WORK. Special problems for individual students who are capable of pursuing independent investigations. For zoology majors.

(3) I, II, S (Staff)

111 – SPECIAL MICROTECHNIQUES IN ZOOLOGY. Training in new and special methods not practiced in Zoology 101a. Suitable for professional zoological training in microscopy.

Prerequisites: Zoology 1 and 101a.

(3) I, II, S (Brauer, Sawyer)

112 – ICHTHYOLOGY. Taxonomy of fishes with life-histories and biology of types. Fish structure and physiology. Fish culture and economic ichthyology; care of fishes, aquaria, local fishes.

Prerequisite: Zoology 1.

(4) I (Allen)

114a-d – ZOOLOGICAL SEMINAR. Presentation of results of research; reports on technical papers in current literature; book reviews; news notes; discussions of recent developments in zoology; and reports on meetings of scientific societies. For students majoring in biological subjects.

(1) I, II (Staff)

117 – MEDICAL PROTOZOOLOGY. The etiology, epidemiology, pathology, diagnosis, prophylaxis and control of parasitic protozoa, with special emphasis on life cycles and detailed studies of the protozoan parasites of man. Two lectures and two laboratory periods per week. Given alternate years.

Prerequisite: Zoology 105.

(4) II (Edney)

119 – HELMINTHOLOGY. The etiology, epidemiology, pathology, diagnosis, prophylaxis and control of trematode, cestode and nematode parasites of vertebrates, with special emphasis on those of veterinary and medical importance. Two lectures, two laboratory periods. Given alternate years.

Prerequisite: Zoology 105.

(4) II, S (Edney)

120 – ANIMAL CYTOLOGY. Cell morphology, with a study of the nature and significance of cytoplasmic and nuclear components, chromosomes and their patterns, in somatic and germ cells. Two lectures and two laboratory periods each week.

Prerequisites: Zoology 1, with 101a and b, or satisfactory equivalents.

(4) II (Sawyer)

123 – MEDICAL ENTOMOLOGY. Studies of arthropod vectors of human diseases and arthropod pests. Taxonomy, range, life histories, etiology, and habits of groups of major importance to human health and comfort. Methods of control, instruction in control programs, and adaptation to locality. Two hours lecture, one laboratory, and one field period per week. Given alternate years.

Prerequisite: Zoology 1.

(4) II (Neel)

130 – LIMNOLOGY. Field and laboratory studies of physical, physiographic, chemical, and biological features which affect biological productivity of inland waters, with especial reference to animal productivity. Analysis of the fresh-water environment. One lecture, one recitation, one laboratory or field excursion per week (4 hours).

Prerequisite: Zoology 1.

(4) II (Neel)

157a – INVERTEBRATE ANATOMY. An advanced course on the comparative anatomy of invertebrate animals with special attention paid to phylogeny, organology, and taxonomy.

Prerequisite: Zoology 1.

(4) I (Neel)

157b – ADVANCED VERTEBRATE ANATOMY. Systematic study of chordates with emphasis on classes, orders and families of vertebrates. Comparative study of organs and systems, ontogeny and phylogeny. Preparation of drawings and charts of the various systems. Dissection of typical protochordates, lamprey, shark, mudpuppy and cat. Complete demonstration of mammalian anatomy. Two lectures, two laboratory periods per week.

Prerequisite: Zoology 1.

(4) I, II (Edney)

166 — PHYSIOLOGY OF DEVELOPMENT. A review of the older theories of differentiation and a critical analysis of the dynamic physiological concepts and their application to the structure-time relationships in organismic development. Lectures, assigned readings and reports.

Prerequisite: Zoology 106.

I, S (Brauer)

202, 205, 206, 209, 212, and 220. Problem courses for graduate students electing to do independent research in Zoology, in any one of the fields named below. Conferences; field, laboratory and library work. Reports. Theses to be based on the completion of a significant piece of work.

Prerequisites: the equivalent of the (3 credits each semester)
bachelor's degree in zoology and I, II, S
evidence of capacity for research.

202a-d — PROBLEMS IN ORNITHOLOGY. (Allen)

205a-d — PROBLEMS IN PARASITOLOGY. (Edney)

206a-d — PROBLEMS IN EMBRYOLOGY AND HISTOLOGY.
(Brauer)

209a-d — PROBLEMS IN ECOLOGY AND LIMNOLOGY. (Neel)

212a-d — PROBLEMS IN ICHTHYOLOGY. (Allen)

220a-d — PROBLEMS IN CYTOLOGY. (Sawyer)

IV. PHYSICAL SCIENCES

CHEMISTRY

Work leading to the master's degree and to the doctor's degree with a major in chemistry must conform to the general rules and regulations of the Graduate School.

For the degree of Master of Science, twenty-four semester hours in graduate courses exclusive of the thesis, one academic year (36 weeks) in residence, and an acceptable thesis, are required. A good reading knowledge of scientific German is required. It is strongly recommended that the candidate be able to read scientific French also.

A maximum of one-third of the work may be taken in courses lying outside of the department which are approved by the student's committee.

The degree of Doctor of Philosophy is conferred upon a candidate who, after completing not less than three years of graduate work in chemistry and allied fields, presents sufficient evidence of scholarly attainments. Evidence is based on course work, research, examinations, and the dissertation.

110a, b – ADVANCED INORGANIC CHEMISTRY. A systematic course in inorganic chemistry with especial emphasis upon the periodic classification, valence, and the preparation and reactions of various types of inorganic compounds. Lecture, two hours.

Prerequisites: quantitative analysis and organic chemistry.

(2) I, II, S (Schreyer)

111 – ADVANCED INORGANIC LABORATORY. Laboratory exercises are chosen to illustrate the methods of preparation of the different classes of inorganic compounds, and to provide training in the newer and more difficult techniques in the field of inorganic synthesis.

Prerequisite or concurrent: Chemistry 110a.

(1) II (Schreyer)

114 – NON-AQUEOUS SOLUTIONS. A study of the properties of non-aqueous solutions and of reactions in non-aqueous media.

Prerequisite: Chemistry 140b.

(2) II (Dawson)

(Offered 1949-50 and alternate years thereafter.)

115a, b – NUCLEAR CHEMISTRY. The chemistry of the radio-elements and other substances involved in nuclear reactions. Lecture, two hours.

Prerequisite: Chemistry 140b.

(2) I, II (Leader)

(Offered 1948-49 and alternate years thereafter.)

120 – ADVANCED QUALITATIVE ANALYSIS. A study of qualitative analysis for the anions and the separation and detection of the less common elements, employing a rather rigorous physico-chemical method of approach to the theory of separation. Lecture, one hour; laboratory, six hours.

(3) I (Schreyer)

121 – SEMIMICRO QUANTITATIVE ANALYSIS. A laboratory course devoted to the quantitative analysis of both organic and inorganic substances by the use of semimicro techniques. Lecture, one hour; laboratory, six hours.

Prerequisite: Chemistry 21b.

(3) II (Cavagnol)

122 — INSTRUMENTAL ANALYSIS. The applications of microscopic, colorimetric, spectrophotometric, polarographic, and electrometric methods. Lecture, one hour; laboratory, six hours.

Prerequisite: Chemistry 21b.

(3) I

125 — ADVANCED QUANTITATIVE ANALYSIS. The complete analysis of a silicate mineral or ore, and the alloys of iron, copper, and aluminum. Lecture, one hour; laboratory, six hours.

Prerequisite: Chemistry 21b.

(3) II (Wagner)

(Offered 1948-49 and alternate years thereafter.)

126 — INDUSTRIAL ANALYSIS. The use of special industrial control methods for the analysis of water, coal, petroleum, fuel gases and atmospheric constituents. Laboratory, six hours.

Prerequisite: Chemistry 21a.

(2) II (Wagner)

(Offered 1949-50 and alternate years thereafter.)

127 — MICROSCOPIC ANALYSIS. Qualitative and semi-quantitative analysis of microgram amounts of various cation groups in a single drop under a microscope. Laboratory, six hours.

Prerequisite: Chemistry 21b.

(2) (Wagner)

(Offered 1949-50 and alternate years thereafter.)

129 — SELECTED PROBLEMS IN QUANTITATIVE ANALYSIS. Laboratory, nine hours. (Offered upon request.)

Prerequisite: Chemistry 21b.

(3) (Stewart, Wagner)

130a, b — ORGANIC CHEMISTRY. A systematic study of organic compounds. Lecture, three hours; laboratory, four hours.

Prerequisite: Chemistry 1b.

(5) I, II, S (Barkenbus)

133 — QUALITATIVE ORGANIC ANALYSIS. A systematic study of the separation and identification of organic compounds. Laboratory, nine hours.

Prerequisite: Chemistry 130b or 30b.

(3) I, S (Barkenbus, Estes)

136 — SYNTHETIC ORGANIC CHEMISTRY. A critical comparison of preparation methods accompanied by laboratory work and reports. Laboratory, nine hours.

Prerequisite: Chemistry 130a.

(5) II (Barkenbus)

140a, b — PHYSICAL CHEMISTRY. The fundamental principles of chemistry are studied with emphasis upon the application of these in the correlation of natural phenomena. Lecture and recitation, three hours.

Prerequisites: Quantitative Analysis;

(3) I, II, S (Dawson)

Mathematics 20b; and Physics 3b.

141 — CHEMICAL THERMODYNAMICS. Principles and applications of chemical thermodynamics. Lecture, three hours.

Prerequisite: Chemistry 140b.

(3) II (Dawson)

143 — PHYSICAL CHEMISTRY. For students in agriculture and the biological sciences. Lecture and recitation, three hours; laboratory, six hours.

Prerequisites: Chemistry 1b or 4b, and 37; and Physics 1b.

(5) I

(Offered 1948-49 and alternate years thereafter.)

144a, b — PHYSICAL CHEMISTRY LABORATORY. Laboratory studies in physical chemistry to accompany Chemistry 140a, Laboratory, six hours.

(2) I, II, S (Leader)

145 — COLLOID CHEMISTRY. Lectures, recitations, and assigned readings on the chemistry of colloids. Lectures and recitations, two hours.

Prerequisite: Chemistry 140b.

(2) II (Leader)

(Offered 1948-49 and alternate years thereafter.)

150a, b — PHYSIOLOGICAL CHEMISTRY. A study of the chemistry of living processes. Lectures and recitations, three hours; laboratory, three hours.

Prerequisites: Chemistry 1b or 4b and 37; and Physics 1b.

(4) I, II

160 — INDUSTRIAL CHEMISTRY. A survey of the chemistry of manufacturing processes. Lecture, three hours.

Prerequisite: Chemistry 140b.

(3) I (Meadow)

161 — INDUSTRIAL CHEMICAL CALCULATIONS. Lecture and recitations, two hours.

Prerequisite: Chemistry 140b.

(2) II (Meadow)

181 — CHEMICAL LITERATURE. Training in the use of chemical literature. One hour per week.

Prerequisite: permission of Department.

(1) I (Stewart)

188a — SEMINAR. Reports and discussions on recent research and current chemical literature. Each student is required to present a minimum of four reports to the student-faculty group to earn one semester hour of credit. Attendance at the seminar for two semesters is required before one hour of credit is earned.

(0) (Staff)

188b — SEMINAR. A continuation of 188a.

(1) II (Staff)

210 — TOPICS IN INORGANIC CHEMISTRY. The chemistry of the rare earths and other less common elements. Selected topics dealing with recent advances in the field. Lecture, two hours.

Prerequisite: Chemistry 110b.

(2) I (Schreyer)

(Offered 1949-50 and alternate years thereafter.)

220 — THE CHEMICAL POLARIZING MICROSCOPE. The theory and practice in the use of the polarizing microscope as a means of identifying crystalline chemical substances. Laboratory, six hours.

Prerequisite: Chemistry 140b.

(2) II

(Offered 1949-50 and alternate years thereafter.)

221 — QUANTITATIVE MICROANALYSIS. The quantitative analysis of organic and inorganic substances in the microgram and submicrogram range. Laboratory, six hours.

Prerequisite: Chemistry 21b.

(2) I

(Offered 1948-49 and alternate years thereafter.)

222 — ELECTROMETRIC ANALYSIS. The theory and application of potentiometric, polarographic, and conductometric measurements. Lecture, one hour; laboratory, three hours.

Prerequisites: Chemistry 122 and 140b.

(2) I (Wagner)

(Offered 1948-49 and alternate years thereafter.)

230a, b — SYNTHESIS OF ORGANIC COMPOUNDS. A thorough study of the types of reactions used in organic synthesis with emphasis on the conditions and reagents that can be used. Lecture, two hours.

Prerequisite: Chemistry 130b.

(2) I, II (Barkenbus)

(Offered 1948-49 and alternate years thereafter.)

232 — STEREOISOMERISM OF CARBON COMPOUNDS. Optical isomerism of compounds containing asymmetric carbon atoms; polarimetry; optical isomerism of compounds containing no individual asymmetric atoms; stereochemistry of biphenyls and related compounds; cis-trans isomerism; and stereochemistry of the sugars. Lectures, three hours. (Offered each year.)

Prerequisite: Chemistry 130b.

(3) II (Estes)

234a, b — THE ELECTRONIC THEORY AS APPLIED TO ORGANIC REACTIONS. A study of the modern viewpoints of valence and their application to the interpretation of organic reactions. Lecture, two hours.

Prerequisites: Chemistry 130b and 140b.

(2) I, II (Estes)

(Offered 1949-50 and alternate years thereafter.)

238 — SURVEY OF ORGANIC CHEMISTRY. A general survey of the field of organic chemistry. Lecture, four hours. (Offered each year.)

Prerequisite: Chemistry 130b or equivalent.

(4) I (Bakenbus)

239a, b — TOPICS IN ORGANIC CHEMISTRY. Selected topics which may include heterocyclic organic compounds, natural and synthetic dyes, carbon-hydrates, nitrogen compounds, and other recent advances in the field of organic chemistry. Lecture, two hours.

Prerequisite: Chemistry 130b.

(2) I, II

(Offered 1949-50 and alternate years thereafter.)

240 — ELECTROCHEMISTRY. Modern theories of solutions. Applications of electrochemical methods in determining the properties of solutions. Polarization. Electrolysis. Equilibrium in solutions of electrolytes. Lecture, three hours.

Prerequisite: Chemistry 140b.

(3) I

(Offered 1948-49 and alternate years thereafter.)

244 — PHASE RULE. Lectures and assigned readings on the theory and application of the phase rule. Lecture, two hours.

Prerequisite: Chemistry 140b.

(2) II (Schreyer)

(Offered 1948-49 and alternate years thereafter.)

245 — CATALYSIS. Theories of homogenous and heterogeneous catalysis and applications in chemical processes. Lecture, two hours.

Prerequisite: Chemistry 140b.

(2) II

(Offered 1949-50 and alternate years thereafter.)

246 — CHEMICAL KINETICS. Studies of chemical reactions from the standpoint of velocity and mechanism. Lecture, three hours.

Prerequisite: Chemistry 140b.

(3) (Leader)

(Offered 1949-50 and alternate years thereafter.)

248 — CHEMICAL PRINCIPLES. Lectures, recitations, and problems dealing with the states of matter, properties of solutions, chemical and phase equilibria, chemical kinetics and the elements of thermodynamics and electrochemistry. Lecture, four hours. (Offered each year.)

Prerequisites: College Physics; Integral Calculus;

(4) I (Leader)

and one course in physical chemistry.

249a, b — TOPICS IN PHYSICAL CHEMISTRY. Selected topics which may include photochemistry, structure of crystals, molecular spectra, nature of the chemical bond, and other recent advances in the field of physical chemistry. Lecture, two hours.

Prerequisites: Chemistry 140b; and Mathematics 105. (2)
(Offered 1949-50 and alternate years thereafter.)

288a-h — GRADUATE SEMINAR. Reports and discussions on recent research and current literature. Required of all graduate students.
(1 each) I, II (Staff)

290a-1 — RESEARCH IN CHEMISTRY. Work may be done in the following fields, subject to the approval of the Departmental Graduate Committee: Analytical Chemistry, Industrial Chemistry, Inorganic Chemistry, Organic Chemistry, or Physical Chemistry.
(5 each) I, II, S (Staff)

ENGINEERING (See Engineering)

GEOGRAPHY

100 — REGIONAL GEOGRAPHY OF ANGLO-AMERICA. A study of natural resources, industries, and economic and social developments of the United States, Canada, and Alaska. A regional interpretation which considers the effects, location, physical features, climate, and soils on the production of raw materials and food.

Prerequisite: one geography course or permission of instructor. (2) I, S (Tuthill)

101 — GEOGRAPHY OF KENTUCKY. Relationships between the physical environment of Kentucky and the agricultural, industrial, and social conditions. Emphasis upon problems involving human activities, distribution of population, and sequent occupancy with special reference to regional and inter-regional adjustments.

Prerequisite: one geographical course or permission of instructor. (2) II, S (Schwendeman)

102 — REGIONAL GEOGRAPHY OF LATIN AMERICA. A study of the countries and geographic regions of Mexico, Central America, and South America. Special reference will be made to the geographic bases for inter-American relationships.

Prerequisite: one geography course or permission of instructor. (2) I (Schwendeman)

103 — REGIONAL GEOGRAPHY OF EUROPE. A study of the European continent exclusive of the U. S. S. R. (see Geography 204) involving the major geographic regions. Climatic, soil, terrain, mineral, and biotic factors will be discussed on both a continental and regional basis. Population problems, economic adjustments, and political significance of resources will also be studied.

Prerequisite: one geography course or permission of instructor. (2) I (Field)

104 — REGIONAL GEOGRAPHY OF ASIA. A study of the countries of Asia and their geographic foundations. Major emphasis is given to the problems and development of the U.S.S.R., India, China, and Japan and to an

evaluation of their resources. The role of Asia in the international landscape will also be studied.

Prerequisite: one course in geography or permission of instructor.

(2) II (Tuthill)

105 – REGIONAL GEOGRAPHY OF AUSTRALIA AND THE PACIFIC ISLANDS. A study made of the geographic problems and adjustments of the peoples and countries of the Pacific area.

Prerequisite: one course in geography or permission of instructor.

(2) II (Field)

106 – REGIONAL GEOGRAPHY OF AFRICA. A study of African peoples, countries and colonies from the viewpoint of their adjustment to the natural regions.

Prerequisite: one course in geography or permission of instructor.

(2) II (Field)

110 – ADVANCED ECONOMIC GEOGRAPHY. The purpose of this course is to enable upper division students, who can offer Geography 10 – Economic Geography Survey, as a prerequisite, to carry on more detailed analyses of the various commodities and activities which contribute to national and international economic life. The geographic foundations and aspects of agriculture, manufacturing, and commerce will be subjected to analytical treatment in order that the pattern of their interrelationships be recognized. Various agricultural, mineral, and manufactured commodities will be studied both as exemplification of the above analyses and to further expend the content of economic geographic information. Particular attention will be directed toward modern transportation, and trade routes, and the use of statistical data.

Prerequisite: Geography 10.

(2) II (Tuthill)

112 – CONSERVATION OF NATURAL RESOURCES. A study of the bases of, needs for, and problems in conserving natural resources. The content will involve attention to such topics as soils, marginal land use, reclamation, forest conservation, water power, flood control, mineral conservation, wildlife, recreational resources, and the conservation of human beings. The materials will concern the resources situation within the United States.

Prerequisite: Geography 10 or permission of instructor.

(2) I (Tuthill)

122 – APPLIED CLIMATOLOGY. The study of how climatical data can be used to apply toward better planning in such specific occupations as agriculture, ranching, silviculture, manufacture, transportation, and recreation. Attention will also be directed to the locative influences of climate.

Prerequisite: Geography 22 or permission of instructor.

(2) II (Schwendeman)

130 – REGIONAL FIELD OBSERVATION. A comparative study of at least four selected regions on any one field trip. The work will consist of preliminary reading, traveling over the regions with close inspection of selected features, and written report of both reading and field work.

Prerequisite: one course in geography.

(3) S (Staff)

132a-d – INDEPENDENT WORK IN GEOGRAPHY. Students registering in this course will engage in individual research involving such problems as: (a) materials and methods in teaching geography; (b) the historical evolution of geography; (c) map reading and interpretation; (d) special area studies; (e) other topics may be elected by consent of instructor.

Prerequisite: permission of instructor.

(3) I, II, S (Staff)

133a-k — READING AND REPORT. Students registered in any two credit upper division course in geography may earn a third credit in this course by registering for Geography 133 and undertaking a study of a special problem related to the course and doing additional readings and reports. (Geography 133 can be elected only by students regularly enrolled in an upper division 2 credit course.) (1 each) I, II, S (Staff)

134 — CARTOGRAPHY. A course in the construction and interpretation of maps. (3) I, II, S (Staff)

140 — GEOGRAPHICAL FOUNDATIONS OF WORLD POWER. A study of the influence of such factors as location, size, form, surface, climate, and natural resources, or the rise and fall of nations. Special consideration will be given to such modern theories as geopolitics and regionalism.
Prerequisite: one course in geography or permission of instructor. (2) I (Schwendeman)

202 — SEMINAR, GEOGRAPHY OF THE CARIBBEAN REGION. This seminar will take as its principal emphasis the islands of the Caribbean Region. A study will be made of the geographical bases for economic livelihood, their present resource contributions, the significance of their location and their individual and collective insular problems.
Prerequisite: Geography 102. (3) I (Tuthill)

203 — SEMINAR, GEOGRAPHY OF THE MEDITERRANEAN BASIN AND THE MIDDLE EAST. This seminar will involve the study of geographical problems arising in the crucial Mediterranean area. Particular attention will be directed to the unique locative influences and their effects upon geographical developments in Europe, Asia, and Africa.
Prerequisite: Geography 103. (3) I (Schwendeman)

204 — SEMINAR, GEOGRAPHY OF THE U. S. S. R. This seminar will involve study of the regional structure, relationships and problems within Soviet Russia. An evaluation will be made of the resource basis of modern Soviet development and of present trends in Soviet land expansion.
Prerequisite: Geography 104. (3) II (Tuthill)

GEOLOGY

101a — PALEONTOLOGY. A study of fossil invertebrates, their nature, classification, and geological distribution. One lecture, four hours laboratory per week.
Prerequisites: Geology 30a, b; and General Zoology or background in zoology. (3) I (McFarlan)

101b — PALEONTOLOGY. The study of geological faunas. Practice in determining stratigraphic horizons. One lecture, four hours laboratory per week.
Prerequisite: Geology 101a. (3) II (McFarlan)

105a-f — INDEPENDENT WORK IN GEOLOGY. Directed work in independent investigations. Thesis required. (3 each)

107a-f — ADVANCED FIELD GEOLOGY. A field course in geologic mapping involving problems of local structure and stratigraphy. Six hours a week in the field.
Prerequisite: Geology 10a, b. (2) I, II (McFarlan and Nelson)

112 — ECONOMIC GEOLOGY. Mineral deposits other than petroleum and natural gas. A study of the distribution, mode of occurrence, origin, methods of search for and uses of deposits of economic importance.

Prerequisite: Geology 30a, b; and 123a, b.

(4) (Brown)

118a-d — FIELD WORK IN REGIONAL GEOLOGY. Eight weeks in the field. The course is an effort to bring the student into contact with diverse geological phenomena and problems. Practice in geological methods. The Department conducts a field camp in Gunnison County, Colorado. See special announcement.

Prerequisite: Geology 30a, b.

(8) S (McFarland, Nelson and Brown)

120a — GEOLOGY OF KENTUCKY. A study of the geological features of the state other than mineral resources. These include the major events in its geological history, the development of regional characteristics and an explanation of its scenic and natural wonders.

(3) McFarlan

120b — GEOLOGY OF KENTUCKY. The mineral resources of the state, their distribution, origin, and uses. Fossil record.

(3) McFarlan

123a — MINERALOGY. A study of geometrical crystallography and other physical properties useful in mineral identification. One lecture, four hours laboratory per week.

Prerequisites: Geology 30a, b; and Chem. 1a, b, or background in Chemistry.

(3) I (Fisher)

123b — MINERALOGY. The determination of minerals by physical properties, blowpipe analysis, and the petrographic microscope. Includes a study of the origin, occurrence, and associations of these minerals. One lecture, four hours laboratory per week.

Prerequisite: Geology 123a.

(3) II (Fisher)

124a-c — REGIONAL GEOLOGY. A study of the geological regions of the united States.

Prerequisites: Geology 30a, b.

(3) I, II (Hamilton)

126a, b — SEMINAR.

(1 each)

127 — PETROLEUM GEOLOGY. The origin and accumulation of petroleum and natural gas. A study of geological methods used in exploratory work and in the development of known fields. Geology of the principle producing fields.

Prerequisites: Geology 30a, b; and General Elementary Physics.

(2)

208 — STRUCTURAL GEOLOGY. A study of the structural features of the earth's crust with an analysis of the mechanics involved. Three lectures and recitations, or 2 lectures and one laboratory per week.

Prerequisites: Physics 1a, b; Geology 30a, b; and 124a, b.

(3) (Nelson)

210a — STRATIGRAPHIC PALEONTOLOGY. The succession of Paleozoic faunas and their use for stratigraphic correlations. One lecture, four hours laboratory per week.

Prerequisites: Geology 30a, b; and 101a, b.

(3) I (McFarlan)

210b – STRATIGRAPHIC PALEONTOLOGY. A continuation of 210a dealing with the Mesozoic and Cenozoic faunas. One lecture, four hours laboratory per week. (3) II (McFarlan)

212a – OPTICAL MINERALOGY. A study of the optical properties of minerals in thin sections by means of the petrographic microscope. One lecture, four hours laboratory per week.
Prerequisites: Geology 123a, b; and Physics 1a, b. (3) (Brown)

212b – SEDIMENTARY PETROLOGY. A study of sedimentary rocks based on microscopical analysis. One lecture and four hours of laboratory per week.
Prerequisite: Geology 212a. (3)

212c – PETROLOGY OF THE IGNEOUS ROCKS. The occurrence, origin and classification of igneous rocks. Identification with the petrographic microscope. An introduction to the metamorphic rocks. One lecture, four hours laboratory per week.
Prerequisite: Geology 212a. (3) (Brown)

213 – ADVANCED ECONOMIC GEOLOGY. Lecture, 2 hours; laboratory, 2 hours. (3) (Nelson)

215 – ADVANCED PETROLEUM GEOLOGY. The use of well cuttings, electrical logs, and other methods and principles of exploratory geology. A study of sedimentation and sedimentary rocks. Lecture, 2 hours; laboratory, 4 hours. (4) (Jacobsen)

216 – ENGINEERING AND GROUNDWATER GEOLOGY. Professional training in the work of the geologic consultant and staff geologist in engineering work. Exploratory work for industrial and farm groundwater supplies. (3)

217a-d – SEMINAR. (1 each)

500-1 – THESIS. (0)

500-2 – THESIS. (0)

500-3 – THESIS. (0)

MATHEMATICS AND ASTRONOMY

Graduate students will be able to obtain sufficient work to qualify for the doctor's degree. Twelve semester hours beyond integral calculus are required before counting work toward an advanced degree.

101a-f – INDEPENDENT WORK IN MATHEMATICS. Reading courses below the 200 level for upper division and graduate students of high standing. (3 each) (Staff)

102 – VECTOR ANALYSIS. Contents: the algebra and calculus of vectors; applications to geometry, electricity, and physics; harmonic functions and potentials.
Prerequisite: Math. and Ast. 20b. (3) (Goodman)

103 — THEORY OF EQUATIONS. Topics included: solutions of cubic and quartic equations; ruler and compass constructions; roots of unity; solutions of numerical equations, systems of linear equations, symmetric functions, and resultants.

Prerequisite: Math. and Ast. 20a.

(3) (Downing)

105a — DIFFERENTIAL EQUATIONS. A first course including first order linear differential equations, homogeneous equations, exact equations, second order equations with constant coefficients, and numerous applications.

Prerequisite: Math. and Ast. 20b.

(3) I, II, S (Staff)

105b — DIFFERENTIAL EQUATIONS. Further study of ordinary differential equations, special types, singular solutions, and integration in series.

Prerequisite: Math. and Ast. 105a.

(3) (Senior Staff)

106a, b — ADVANCED CALCULUS. Continuous and discontinuous function, differentiable and non-differentiable functions, convergence of sequences and infinite series, uniform convergence of series of functions, partial differentiation, implicit function, the Riemann integral, the gamma and beta functions, line surface and space integrals, introduction to the theory of functions of a complex variable.

Prerequisite: Math. and Ast. 25 or equivalent.

(3 ea.) (Downing)

107 — PROJECTIVE GEOMETRY. A brief course in synthetic projective geometry. Topics include: harmonic forms, projective related primitive forms, curves and pencils of rays of second order, ruled surfaces of second order, theory of poles and polars, involutions, inversion.

Prerequisite: permission of instructor.

(3) (Pence)

109a, b — FUNCTIONS OF A COMPLEX VARIABLE. Differentiation and integration of functions of a complex variable, contour integration, Cauchy-Goursat Theorem, Cauchy Integral Formula, poles and residues, the linear fractional transformation, conformal mapping, Taylor series, Laurent series, the Riemann sphere, Riemann surfaces, applications to simple physical problems on temperature distribution, electrical potential, and fluid flow.

Prerequisite: Math. and Ast. 106b.

(3 ea.) (Goodman)

116 — ANALYTIC MECHANICS. Topics included: composition and resolution of forces, statics of a particle, moments, couples, center of gravity, friction, simple harmonic motion, work, energy, and constrained motion.

Prerequisite: Math. and Ast. 20b.

(3) (Leser)

118 — SOLID ANALYTIC GEOMETRY. The usual introduction to the geometry of three dimensional space. Topics studied include the development of linear systems of planes, plane coordinates, the concept of infinity, transformation of coordinates, types of surfaces, quadric surfaces, tetrahedral coordinates.

Prerequisite: Math. and Ast. 20a.

(3) (Brown)

119 — COLLEGE GEOMETRY. Introduction to a wide and extensive body of synthetic geometry. It concerns the geometry of the triangle and the circle, and requires only the known Euclidean concepts.

Prerequisite: permission of instructor.

(3) (Baskett)

120 — MATHEMATICAL STATISTICS. Topics considered: averages, coefficients of dispersion and skewness, correlation and regression lines, curve

fitting, Bernoulli Theorem, DeMoivre-Laplace Theorem, generating functions, sampling.

Prerequisite: Math. and Ast. 20b. (3) (South)

122 — ACTUARIAL MATHEMATICS. Theory of mortality tables, life annuities, premiums, terminal reserves, joint-life annuities and insurances.

Prerequisite: Math. and Ast. 20b. (3) (South)

123 — CURVE TRACING. A study of various methods for sketching algebraic curves. Emphasis on the analytic polygon in finding approximations to the form of the curve in the finite portion of the plane and at infinity.

Prerequisite: permission of instructor. (3) I (Pence)

126a, b — INTRODUCTION TO HIGHER ALGEBRA. Integral domains, fields, rings, polynomials, groups, vector spaces, matrices.

Prerequisite: permission of instructor. (3 ea.) (Ward)

127a, b — INTRODUCTION TO HIGHER GEOMETRY. The principal aim of this course is to initiate the student in the basic ideas and methods of higher geometry and to furnish him with an adequate background for further geometrical studies. Special emphasis is laid on fundamentals common to all geometry. The geometries associated with the projective group and the group of circular transformations are selected for intensive study.

Prerequisite: Math. and Ast. 27 or equivalent. (3) (Pence)

128a — INTRODUCTION TO APPLIED MATHEMATICS. Included in topics studied are infinite series, complex numbers, Fourier series, linear differential equations, Laplace transforms and applications to electrical oscillations.

Prerequisite: Math. and Ast. C105a. (3) (Leser)

128b — INTRODUCTION TO APPLIED MATHEMATICS. An extension of 128a including further applications of Laplace transforms to mechanical vibrations and theory of elasticity, Bessel functions, Legendre differential equations, the gamma, beta, and error functions.

Prerequisite: Math. and Ast. 128a. (3) (Leser)

129 — PROBABILITY. Theorems of total and compound probability, Bernoulli's Theorem, Bayes' Theorem, Poisson Law, Expected value, Law of large numbers. Distribution functions and characteristic functions.

Prerequisite: Math. and Ast. 20b. (3) (South)

132 — THE CALCULUS OF FINITE DIFFERENCES. A study of the methods of differencing, interpolation, finite integration, summation of series, approximate integration and difference equations.

Prerequisite: Math. and Ast. 20b. (3) (South)

141 — INTRODUCTION TO THEORY OF NUMBERS. Divisibility, prime numbers congruences and residues, Diophantine equations.

Prerequisite: permission of instructor. (3) (Ward)

144a-f — PROBLEM SEMINAR. Assignment of individual reports from the students, on current research papers. Problems from various fields of mathematics. The problems and reports will be varied from term to term to meet the special needs of the students.

Prerequisite: permission of instructor. (2 each) (Senior Staff)

201a-f — INDEPENDENT WORK IN MATHEMATICS. Reading courses in the 200 group for graduate students. (3 each) (Senior Staff)

202a, b — ALGEBRAIC CURVES. The topics studied include general properties of algebraic curves, the theory of residuation, singular points, covariant curves, theory of poles and polars, polar reciprocation, characteristics of curves, rational transformations, unicursal curves, higher singularities, systems of curves.

Prerequisites: Math. and Ast. 127a, b. (3) (Pence)

204a, b — CALCULUS OF VARIATIONS. The ordinary problem for the plane and space cases; the necessary conditions of Euler, Weierstrass, Legendre, and Jacobi. The parametric problem; the isoperimetric problem. Sufficiency conditions.

Prerequisite: Math. and Ast. 105b. (3) (Downing)

205 — DIFFERENTIAL GEOMETRY. Metric differential geometry of curves and surfaces in 3 dimensional Euclidean space, space curves and developable surfaces, curvature, determination of a surface by its first and second fundamental forms, geodesic curvature and geodesics, mapping of surfaces, absolute geometry of a surface.

Prerequisite: permission of instructor. (3) I (Downing)

206 — THEORY OF GROUPS. Permutation groups, isomorphisms, the group postulates, abstract groups, automorphisms, fundamental theorems for groups, homomorphisms, quotient groups, direct products, Abelian groups, groups of transformations, Galois groups.

Prerequisite: Math. and Ast. 126a, b, or permission of instructor. (3)

208a, b — FUNCTIONS OF REAL VARIABLE. Brief discussion of real numbers; continuous functions, semi-continuous functions, functions of bounded variations; Stieltjes Integral, the derivative; modern theory of measure and integration, important inequalities, abstract spaces.

Prerequisite: Math. and Ast. 106b, or permission of instructor. (3 ea.) (Cowling)

209a-f — SELECTED TOPICS IN THE THEORY OF COMPLEX VARIABLES. Analytic continuation, functions with natural boundaries, gap theorems, over-convergence, Taylor series analysis, infinite products, entire functions, normal families of functions, the Riemann mapping theorem, Dirichlet series with applications to the analytic theory of numbers. The contents of this course may be varied from term to term to meet the special needs of the students.

Prerequisite: Math. and Ast. 109b, or permission of instructor. (3 each) (Goodman)

210 — ADVANCED MATHEMATICAL STATISTICS. Theory of sampling, the Chi-square distribution, testing statistical hypotheses.

Prerequisite: Math. and Ast. 120. (3) (South)

212a, b — SUMMABLE INFINITE PROCESSES. Fundamental limit ideas applied to infinite sequences, infinite series, infinite products, etc. A study of the classical methods of summability of Cesaro, Holder, Abel, Borel, and Leroy.

Prerequisite: Math. and Ast. 106b, or permission of instructor. (3 ea.) (Cowling, Goodman)

213 — FOURIER SERIES. Expression of a general periodic function as a Fourier series, sufficient conditions for convergence of a Fourier series, an example of a continuous function with divergent Fourier series, Fejer's theorem on summability of a Fourier series, applications to functions of a complex variable, applications to physics.

Prerequisite: Math. and Ast. 106b.

(3) (Cowling, Goodman)

214 — POTENTIAL FUNCTIONS. Topics considered: Attraction of bodies, Newtonian potential function, theorems of Green and Gauss, level surfaces, spherical harmonics.

Prerequisite: Math. and Ast. 105b.

(3) (Downing)

220a, b — MATHEMATICS SEMINAR.

(2) (Senior Staff)

221 — TENSOR ANALYSIS. A course on the modern extension of vector analysis with special emphasis on the applications of differential geometry. Topics considered: algebraic part of the theory of tensors, quadratic differential forms, Riemannian geometry, pseudo-Euclidean geometry.

Prerequisite: permission of instructor.

(3) (Cowling)

222 — ORTHOGONAL SYSTEM OF FUNCTIONS. This course supplements 221. Eigen value problems for linear differential equations, systems of orthogonal functions, spherical harmonics, hypergeometric and related functions, completeness.

Prerequisite: permission of instructor.

(3)

223 — INTEGRAL EQUATIONS. Systems of ordinary linear equations, linear operators, orthogonal systems, linear integral equations of the second kind, theorems of Fredholm, Volterra's equation.

Prerequisite: permission of instructor.

(3)

226a, b — HIGHER ALGEBRA. Groups, rings, fields, extension fields, Galois theory, linear algebras, hypercomplex numbers, ideals.

Prerequisites: Math. and Ast. 126a, b, or

(3) (Ward)

permission of instructor.

227a, b — HIGHER GEOMETRY. Topics studied include projective spaces, groups of collineations, invariants and covariants, Cremona transformations, geometry on an algebraic curve, the plane cubic and quartic, space curves, the cubic surface.

Prerequisites: Math. and Ast. 127a, b.

(3) (Pence)

230 — TOPOLOGY. Calculus of sets, closed and open sets, metric and separable spaces, complete spaces, continuous mappings, connections, separation theorems, simply connected domains, accessibility and Jordan domains.

Prerequisites: Math. and Ast. 125a, b, or permission of instructor.

(3)

231 — ADVANCED DIFFERENTIAL EQUATIONS. Existence theorems, partial differential equations, linear equations with periodic coefficients, classical equations, equations in infinitely many variables.

Prerequisite: Math. and Ast. 105b.

(3) (Downing)

241 — NUMBER THEORY. Peano's Axioms, continued fractions, quadratic fields, algebraic integers, p-adic numbers, etc.

Prerequisites: Math. and Ast. 126b and 141.

(3) (Ward)

500 — 1, 2, 3 THESIS. This course is designed for graduate students working for advanced degrees. The time-credit is on the same basis as for any other course but no point credit is given. (0) (Senior Staff)

ASTRONOMY

251a — CELESTIAL MECHANICS. Topics included: rectilinear motion, central forces, potential and attraction of bodies, and the problem of two bodies. *Prerequisite: Math. and Ast. 105a.* (3) (Downing)

251b — CELESTIAL MECHANICS. Orbit computation, the problem of three bodies, and perturbations. *Prerequisite: Math. and Ast. 251a.* (3) (Downing)

PHARMACY

Major programs leading to advanced degrees are not at present offered in the College of Pharmacy.

101a — ADVANCED ORGANIC PHARMACEUTICAL CHEMISTRY. A study of the classification, source, properties, synthesis and uses of organic medicinal chemicals used as therapeutic agents. Lecture, one hour; laboratory, four hours.

Prerequisites: Phar. Chem. 31a, b, or equivalent; (3) I (Gillis)
and permission of instructor with consent of the Dean.

101b — ADVANCED ORGANIC PHARMACEUTICAL CHEMISTRY. A continuation of 101a. Lecture, one hour; laboratory, four hours.

Prerequisite: permission of instructor with (3) II (Gillis)
consent of the Dean.

102 — BIOCHEMISTRY. An introductory course in biochemistry, including the study of protein, fat and carbohydrate metabolism, and the vitamins, hormones, and substances essential to metabolic processes. Special reference is made to those compounds used in pharmacy. Lecture, one hour; recitation, one hour; laboratory, four hours.

Prerequisites: Phar. Chem. 31a, b. (4) I, II (Gillis)

103a — ADVANCED QUANTITATIVE PHARMACEUTICAL CHEMISTRY. The application of oxidation-reduction principles, physico-chemical methods, and special methods applicable to pharmaceutical analysis. Lecture, one hour; laboratory, six hours.

Prerequisites: Phar. Chem. 31a, b, 33, and 102. (4) I (Gillis)

103b — ADVANCED QUANTITATIVE PHARMACEUTICAL CHEMISTRY. A continuation of 103a. The chemistry and assay of special methods, involving volatile oils, alkaloids, etc. Analysis is made of representative pharmaceutical products. Lecture, one hour; laboratory, six hours.

(4) II (Gillis)

111a — DISPENSING PHARMACY. The receiving, compounding, filling, pricing and dispensing of prescriptions. Selected to acquaint the student with all compounding problems he may encounter in a prescription drug store. Lecture, one hour; recitation, one hour; laboratory, six hours.

Prerequisites: Pharmacy 21, 22, 23a, b, and 26. (5) I (Slessor)

111b — DISPENSING PHARMACY. A continuation of 111a. Included is a study of veterinary pharmacy and insecticides. Lecture, one hour; recitation, one hour; laboratory, six hours. (5) II (Slessor)

122 — U.S.P. and N.F. DRUGS. A study of the official drugs and preparations with special attention to chemical drugs. Emphasis is given to sources, synonyms, proprietaries of like composition, dose and common compounding incompatibilities. Lecture, two hours; recitation, one hour.
Prerequisite: Phar. Chem. 31a, b. (3) I (Lesshafft)

123 — NEW AND MODERN PHARMACY. A comprehensive comparative study of the newer products used in pharmacy. Their uses, chemistry, action and preparations are considered. Lecture, two hours; recitation, one hour.
Prerequisite: Phar. Chem. 31a, b. (3) II (Lesshafft)

131a — BACTERIOLOGY AND SANITATION. Designed to make the pharmacist a force in the field of public health. Lectures in general bacteriology and immunology are followed by instruction and field trips in problems of food and water supply, and of sewage disposal. In the laboratory, the preparation of culture media, cultivation and staining reactions, and principles of sterilization, are followed by pharmaceutical applications. Lecture, two hours; laboratory, two hours.
Prerequisites: Botany 1 and 2; Zoology 1; Phar. Chem. 31a, b, or equivalents. (3) I (Brake)

131b — A continuation of 131a. Lecture, two hours; laboratory, two hours. (3) II (Brake)

133a — HYGIENE AND PUBLIC HEALTH. A study of various public health agencies and their functions, and the relationship of the pharmacist to them, and to the public. Lecture, one hour. (1) I (Tucker)

133b — HYGIENE AND PUBLIC HEALTH. A continuation of 133a. Special consideration is given diseases and conditions constituting major health problems. Lecture, one hour. (1) II (Tucker)

138a — PHARMACOLOGY AND TOXICOLOGY. A presentation of the pharmacodynamic actions, modes of administration, and toxic manifestations of drugs, and the relationship of the pharmacodynamic actions of drugs to their therapeutic use. Lectures are given considering drugs action upon the cardiovascular system, nervous system, etc., and consideration is also given chemotherapeutic agents, i.e., antibiotics, sulfonamides, antimalarials, amebicides, etc. Demonstrations and laboratory work are designed to aid in the elucidation of various manifestations of the action of drugs on the animal organism. This course is intended to equip the pharmacist with the necessary knowledge of the actions of drugs to dispense them intelligently and discuss the relative merits, deficiencies, and pharmacodynamic properties of remedial agents. Lecture, three hours; recitation, one hour; laboratory, two hours.
Prerequisites: Pharmacognosy 27a, b. (5) I (Morris)

138b — PHARMACOLOGY AND TOXICOLOGY. A continuation of 138a. Emergency treatment in cases of poisoning and mechanical injury and standard first aid methods are demonstrated. Actions of poisonous and habit forming drugs are studied, with remedial measures to be applied. Lecture, three hours; recitation, one hour; laboratory, two hours. (5) II (Morris)

PHYSICS

The Department of Physics is well equipped with instruments of precision and has adequate library facilities necessary to the proper conduct of the following list of advanced and graduate courses:

104 — THEORETICAL MECHANICS. A lecture and problem course covering the fundamental laws of mechanics and the conditions under which they hold. Topics include kinematics of a particle, statics and dynamics of a particle and of a rigid body, constrained motion, and oscillatory motion.
Prerequisites: Physics 3b and Mathematics 20b. (4) (Koppius)

108 — LIGHT. A lecture and problem course covering the basic phenomena of geometrical and physical optics. Topics treated include thick lenses, apertures, wave motion, interference, diffraction, polarization, double refraction, absorption, scattering, the velocity of light, and the theory of selected optical instruments.
Prerequisites: Physics 3b and Mathematics 20b. (3) (Hanau)

110 — SPECTROSCOPY. A lecture and problem course dealing with the production, recording, measuring, and interpretation of atomic and molecular spectra. Topics treated include basic principles of atomic structure, conduction of electricity through gases, light sources, prism and grating spectographs, photographic and other recording methods, photometry, and the interpretation of spectra in the fields of atomic structure and spectrographic analysis.
Prerequisites: Physics 3b and Mathematics 20b. (3) (Hanau)

111 — ELECTRICITY AND MAGNETISM. A lecture and problem course dealing with the fundamental theory of electricity and magnetism. The course covers electrostatic forces and energy, conductors and dielectrics, electrolysis, thermoelectricity, magnetic forces and energy of currents, magnetization of iron, and transient and alternating currents.
Prerequisites: Physics 3b and Mathematics 20b. (3) (Hahn)

114 — VACUUM TUBES AND CIRCUIT THEORY. A lecture and problem course covering the theory of vacuum tubes and associated circuits. It includes the solution of selected electronic circuits by the method of the Laplace operator as well as by the method of complex impedance.
Prerequisites: Physics 3b and Mathematics 20b. (3) (Staff)

115 — THEORY OF MEASUREMENTS. A lecture and problem course in the analysis of experimental data. Topics treated include finding an empirical equation to fit a set of data, evaluation of the arbitrary constants, the qualitative and quantitative graph, approximations, probability distributions, errors and deviations, least square equations representing observed data.
Prerequisites: Physics 104 and Mathematics 20b. (3) (Staff)

119 — X-RAYS AND CRYSTAL STRUCTURE. A basic lecture and problem course dealing with the production and properties of X-rays. Topics include the mathematical development of the formulae of absorption, scattering, polarization, etc.; methods of wave length measurement; the Compton effect and related quantum phenomena.
Prerequisites: Physics 3b and Mathematics 20b. (3) (Pardue)

120 — X-RAY TECHNIQUE. An introductory lecture and laboratory course in X-ray technique primarily for medical technologists. The first half of the course deals with the design and operation of X-ray equipment, the physical basis of voltage, current, time and distance factors, intensifying screens, darkroom procedure, etc. The second half is devoted to practice in the radiography of the extremities, chest, head, teeth, etc.

Prerequisite: Physics 1b.

(2) (Staff)

123a — HEAT AND THERMODYNAMICS. A lecture and problem course stressing some of the fundamental principles of heat phenomena (such as high and low temperatures, elementary kinetic theory, specific heat phenomena both classical and modern, expansion, conduction and radiation), the first and second laws of thermodynamics, equations of state for ideal and real gases, continuity and changes of state, derivation of thermodynamic relations and their application to processes in physics and allied sciences.

Prerequisites: Physics 3b and Mathematics 20b.

(3) (Koppius)

123b — HEAT AND THERMODYNAMICS. A continuation of 123a, dealing with thermodynamic functions, thermodynamic equilibrium, the phase rule of phase equilibria, equilibrium in gaseous and liquid systems, ionic equilibrium, electromotive force and free energy, surface phenomena, radiation, Nernst's heat postulate.

Prerequisite: Physics 123a or equivalent.

(3) (Koppius)

125a-d — INDEPENDENT WORK IN PHYSICS.

(3 ea.) (Staff)

130 — EXPERIMENTAL PHYSICS: SPECTROSCOPY. An advanced laboratory course in the use and properties of various light sources, prism and grating spectographs, photographic materials, and photometric methods; qualitative and quantitative analysis of unknown materials by spectrographic methods.

Prerequisite: Physics 110 or permission of instructor.

(2) (Hanau)

131 — EXPERIMENTAL PHYSICS: ELECTRICITY AND MAGNETISM. An advanced laboratory course in electrical measurements. It includes calibration and use of the quadrant electrometer, the d'Arsonval galvanometer and the Type K Potentiometer; studies of dielectrics and the magnetization of iron; measurements of capacitance, resistance and inductance; absolute determinations of electrical quantities.

Prerequisite or concurrent: Physics 111 or equivalent.

(2) (Staff)

134 — EXPERIMENTAL PHYSICS: VACUUM TUBES. An advanced laboratory course dealing with the measurements of circuit and vacuum tube constants, and the experimental study of amplifiers, oscillators, pulse generators, saw-tooth generators, etc.

Prerequisite or concurrent: Physics 114 or equivalent.

(2) (Staff)

135 — EXPERIMENTAL PHYSICS: ATOMICS AND NUCLEONICS. An advanced laboratory course dealing with the methods of detecting and studying nuclear particles. Instruments to be employed in the measurements are ionization chambers, Geiger counters, cloud chambers, photographic films, mass spectrographs, and the Van de Graaff generator. Measurements will be made on half-lives, absorption coefficients, ranges, particle energies. The experiments include methods appropriate to alpha particles, beta particles, photons, neutrons, fission fragments, and mesons.

Prerequisite or concurrent: Physics 155 or equivalent.

(2) (Pardue)

137 — EXPERIMENTAL PHYSICS: HEAT. An advanced laboratory course in modern methods of measuring thermal quantities. Opportunity is provided for using the gas thermometer, resistance thermometer, and types of radiation pyrometers. Experiments include construction and calibration of thermocouples, determination of coefficients of expansion, vapor pressures and densities, viscosity, surface tension, freezing and boiling points, specific and latent heats, ratio of specific heats, thermal conductivities, radiation constants. *Prerequisite or concurrent: Physics 123a or equivalent.* (2) (Koppius)

138 — EXPERIMENTAL PHYSICS: LIGHT. An advanced laboratory course dealing with the properties of lenses, mirrors, prisms, gratings, and combinations of these elements in optical systems. The important phenomena of geometrical and physical optics are studied experimentally as well as the use and properties of specific instruments such as the microscope, telescope, spectrometer, interferometer, polarimeter, etc. *Prerequisite: Physics 108 or permission of instructor.* (2) (Hanau)

155a — FUNDAMENTAL ATOMIC AND NUCLEAR PHYSICS. A lecture and problem course stressing the fundamental principles of atomic and nuclear theory and practice, thereby providing a foundation for students interested either in applied nucleonics or in a broader study of atomic and nuclear physics. Topics: atomic nature of matter; electricity and radiant energy; atomic and molecular structure; general laws of radioactivity; alpha, beta, and gamma radiations and their interaction with matter; nuclear structure; artificial transmutation of nuclei; nuclear fission. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Pardue)

155b — FUNDAMENTAL ATOMIC AND NUCLEAR PHYSICS. A continuation of 155a in which a more detailed and more theoretical study of nuclear structure will be made. Topics: basic facts for nuclear theory (size, spin and statistics), constituent particles, disintegration, nuclear dynamics, and nuclear forces. *Prerequisite: Physics 155a or equivalent.* (3) (Pardue)

205 — KINETIC THEORY OF MATTER. A course of lectures covering the classical kinetic theory of gases. Topics include the theorems of Clausius, Joule, Maxwell and Boltzmann; coefficients of viscosity and slip; Brownian movements and specific heat relations treated from the kinetic theory standpoint; development of equations of change of state. *Prerequisites: two "100" courses in Physics and Mathematics 105a.* (3) (Koppius)

208 — MICROWAVES. A lecture and problem course reviewing electromagnetic wave theory with emphasis on solutions of Maxwell's wave equations and their applications to the modern problems of microwave transmission. Plane, rectangular, and cylindrical wave guides are treated, and the special problems of transmission at hyperfrequency are studied. *Prerequisites: Physics 111; Mathematics 105a, and Electrical Engineering 133 or equivalent.* (3) (Staff)

210 — ELECTRODYNAMICS. A lecture course treating the subject from the point of view of relativity and the electron theory. Topics: the field equations and their transformation properties, the potential solutions of the field

equations, the retarded and simultaneous fields of a point charge, fields of a system of point charges, dynamical equation of the electron. The course will end with a short preview of quantum electrodynamics.

Prerequisites: Physics 111 and Mathematics 105a. (3) (Pardue)

212 — CONDUCTION OF ELECTRICITY THROUGH GASES. A lecture course covering the basic phenomena of electrical discharge in gases at low pressures. Topics include the formation of ions, their mobility, diffusion, and recombination; representative discharges such as the arc, glow, spark, corona, etc.

Prerequisites: Physics 111, and either 110 or 155a; and Mathematics 105a. (3) (Koppius)

213 — ELECTROMAGNETIC THEORY. A lecture course dealing with the application of classical electromagnetic theory to the optical phenomena of reflection, refraction, polarization, and absorption. Isotropic and non-isotropic media, as well as conducting and non-conducting media, are treated.

Prerequisites: Physics 111 and 108; and Mathematics 105a. (3) (Hanau)

214 — TRANSIENT ELECTRIC AND VACUUM TUBE PHENOMENA. A lecture course dealing with transient currents in circuits containing variable amounts of inductance, capacitance, and resistance. Topics include investigation of various types of coupled circuits and vacuum tube circuits. Both the methods of differential equations and of the Laplace transform are used.

Prerequisites: Physics 111 or 114; and Mathematics 105a. (3) (Staff)

215a — QUANTUM THEORY. A lecture course covering a brief review of the origin of quantum theories and of the older theories of Bohr and Sommerfeld, mathematical techniques of quantum mechanics, the general aspects of wave mechanics and matrix mechanics, the uncertainty principle.

Prerequisite: Physics 217b or equivalent. (3) (Hahn)

215b — QUANTUM THEORY. A continuation of 215a with extensions into special methods of solving problems in the theory, problems in more than one dimension, and the Pauli and Dirac theories of the electron.

Prerequisite: Physics 215a or equivalent. (3) (Hahn)

217a — THEORETICAL PHYSICS. A course of lectures presenting the basic aspects of theoretical physics in a unified way. Much of the material will be taken from such standard texts as Page's and Slater and Frank's books on theoretical physics. Representative topics: advanced dynamics, hydrodynamics, elasticity.

Prerequisites: two "100" courses in Physics; and Mathematics 105a. (4) (Pardue)

217b — THEORETICAL PHYSICS. A continuation of 217a, dealing with statistical mechanics, thermodynamics, electrodynamics, relativity, quantum theory.

Prerequisite: Physics 217a or equivalent. (4) (Pardue)

218 — THERMODYNAMICS. A review of the two classical laws of thermodynamics and their dynamical and statistical mechanical support; Nernst's heat theorem; applications of classical thermodynamics to important problems, relativity thermodynamics.

Prerequisites: Physics 123a, b; and Mathematics 105a. (3) (Webb)

220a-h — SEMINAR. A weekly meeting of the staff and graduate students of the department for presentation and discussion of recent developments in physics as reported in the current literature, and of work in progress in the department. Credit is given to those who satisfactorily present papers.

(1 ea.) (Senior Staff)

224 — ADVANCED X-RAYS AND CRYSTAL ANALYSIS. A lecture course dealing with the theories of production, scattering, and absorption of X-rays; the interpretation of X-ray spectra; the analysis of crystals; the experimental techniques of X-ray measurements. Much of the material will be taken from "X-Rays in Theory and Experiment" by Compton and Allison.

Prerequisite: Physics 119.

(3) (Pardue)

226a, b — RESEARCH IN PHYSICS.

(3 ea.) (Senior Staff)

227a, b — RESEARCH IN PHYSICS.

(5 ea.) (Senior Staff)

250 — RELATIVITY. A lecture course dealing with the special and general theories of relativity. The application of the theories to mechanics, electricity and magnetism, and other fields is considered.

Prerequisites: Physics 104 and 111; and Mathematics 105a.

(3) (Webb)

500 — 1-2-3 THESIS. This course is intended for graduate students who are prepared to undertake special problems. Except in the case of a purely mathematical problem the entire time is to be devoted to work in the laboratory.

(0) (Senior Staff)

V. AGRICULTURE

AGRICULTURAL EDUCATION (See Education)

AGRICULTURAL ENTOMOLOGY

102—ECONOMIC ENTOMOLOGY. Especially planned for those intending to take up vocational agricultural teaching and county agent work. The life history, control, and means of identification of the common and important economic insects of Kentucky are considered. The making and care of school collections, cages, and aquariums, are described. Lectures, 2 hours; laboratory, 2 hours. (3) S (Townsend)

103—ECONOMIC ENTOMOLOGY. Fruit and garden insects. Life histories, habits, distribution, and control of insects, injurious to fruit and garden crops, with special attention to those species found in Kentucky. The various diseases, parasites, and predators of these injurious species are also given attention. Lectures, 2 hours; laboratory, 2 hours. *Prerequisite:* Agricultural Entomology 1. (3) I (Townsend)

104—ECONOMIC ENTOMOLOGY. Farm crop insects and animal parasites. Life histories, habits, distribution, and control of insects injurious to common farm crops including those of stored grain and forage; also insect parasites of the common farm animals. The various diseases, parasites, and predators of these injurious species are given attention. Lectures, 2 hours; laboratory, 2 hours. *Prerequisite:* Agricultural Entomology 1. (3) II (Townsend)

105a-b—SYSTEMATIC AND TECHNICAL AGRICULTURAL ENTOMOLOGY. Insect physiology, anatomy, ecology, and taxonomy, entomological literature and technique; studies of special groups of insects. Time to be arranged.

Prerequisites: Agricultural Entomology 1, (3) I, II (Townsend)
and any one of the following: 102, 103, 104.

201a-b—ENTOMOLOGICAL PROBLEMS. Investigations of chosen insect problems, including original work. Discussion and assignment of current insect subjects. Time to be arranged.

Prerequisites: Agricultural Entomology 1, (3) I, II (Price)
103, 104, and 105a, b.

AGRONOMY

COURSES IN CROPS

102—FIELD CROP ECOLOGY. A study of the environmental factors affecting the yield and qualities of field crops. Lectures and recitation, 3 hours. *Prerequisites:* Agr. 1; and Bot. 1. (3) I, S (Phillippe)

103—WEEDS. The important characteristics, identification, and control of weeds, with emphasis on identification and control of Kentucky weeds. *Prerequisite:* Bot. 1. (2) II, S (Phillippe)

104 – ADVANCED CROPS: FORAGE CROPS AND PASTURES. A comprehensive study of forage crops and pastures with special emphasis upon their production and management in Kentucky. Recitation, 3 hours.
Prerequisites: Agr. 1; and Bot. 1. (3) I, S (Alternate Years) (Fergus)

105 – ADVANCED CROPS: TOBACCO AND CEREALS. Tobacco and the important cereal crops are studied in considerable detail as regards distribution, soil, and climatic adaptation, and technique of production. Recitations and lectures, 3 hours.
Prerequisites: Agr. 1; and Bot. 1. (3) II, S (Kinney)

106 – FIELD CROP IMPROVEMENT. A study of the principles involved and the technique used in breeding crop plants. Lectures and recitation, 3 hours.
Prerequisites: Bot. 1; Agr. 1; and A. I. 61. (3) II

109a-c – SPECIAL PROBLEMS IN CROPS.
Prerequisite: Agron. 1. (3) (Fergus and Phillippe)

200a, b – SEMINAR. (1) I, II (Agronomy Staff)

204a, b – SPECIAL PROBLEMS IN PRODUCTION AND MANAGEMENT OF FORAGE CROPS AND PASTURES.
Prerequisite: permission of instructor. (3) II, S (Fergus and Phillippe)

205a, b – SPECIAL PROBLEMS IN PRODUCTION OF TOBACCO OR CEREALS.
Prerequisite: permission of instructor. (3) II, S (Kinney)

COURSES IN SOILS

110 – SOIL BIOLOGY. A study of soil organisms and biological soil processes in relation to soil productivity. Lecture, 1 hour; laboratory, 4 hours.
Prerequisite: Agr. 10; and Bact. 52. (3) I

111 – SOIL CONSERVATION. A study of the scope and nature of the soil conservation problem, and the application of soil conserving methods to the planning and management of individual farms. Lecture and recitation, 2 hours.
Prerequisite: Agron. 10. (2) I, II (Survant)

112a, b – SPECIAL PROBLEMS IN SOILS. Intensive studies of specific soil problems.
Prerequisites: Agr. 10 and permission of instructor. (3) I, II, S (Karraker and Survant)

113 – EXPERIMENTAL METHODS AND INTERPRETATION OF RESULTS. A study of the essentials of reliable experimentation, including sources of error; a study of experimental data with emphasis on interpretation.
Prerequisite: Agr. 10. (3) II (Roberts)

114 – FERTILIZERS AND SOIL MANAGEMENT. Sources, manufacture, evaluation, and use of fertilizers and lime materials; soil moisture, tillage and soil organic matter and nitrogen. Lectures and recitations, 3 hours.
Prerequisite: Agr. 10. (3) II (Karraker)

119 – SOIL ORIGIN, CLASSIFICATION, AND MAPPING. Factors and processes of soil formation, characteristics and agricultural significance of the great soil groups, classification of soils, and the nature, use, and preparation of soil maps. Lectures and recitations, 2 hours. Laboratory and field work by appointment.

Prerequisites: Agr. 10 and permission of instructor. (3) II (Karraker)

200a, b – AGRONOMY SEMINAR. (1) I, II (Agronomy Staff)

212a-d – RESEARCH IN SOILS. Each course offered each semester, but only three hours may be taken in a semester.

Prerequisite: permission of instructors. (3) I, II, S (Weeks, Karraker)

COURSES IN PLANT PATHOLOGY

123a-c – SPECIAL PROBLEMS IN PLANT PATHOLOGY.

Prerequisite: Agron. 23. (3) (Valleau and Diachun)

200a, b – SEMINAR. (1) I, II (Agronomy Staff)

ANIMAL INDUSTRY

COURSES IN ANIMAL HUSBANDRY

100 – ANIMAL BREEDING. History of animal improvement; survey of hereditary traits in livestock; inbreeding and outcrossing; progeny tests and herd analysis. Lecture, 3 hours.

Prerequisite: A. I. 1 and 61. (3) II (Steele)

102 – ADVANCED LIVESTOCK JUDGING. Primarily for judging team candidates. Open only to those who have made good standings in the prerequisite courses. Laboratory, 6 hours.

Prerequisite: A. I. 1 and 2; and permission of instructor. (3) I (Barnhart)

103 – WORK STOCK PRODUCTION. History and importance of the horse and mule industry; selection, breeding, feeding, and management of horses and mules. Lecture, 2 hours; laboratory, 2 hours.

Prerequisite: A. I. 1 and 81. (3) I

104 – SHEEP PRODUCTION. History and importance of the sheep industry; selection, breeding, feeding, and management of sheep; production and handling of wool. Lecture, 2 hours; laboratory, 2 hours.

Prerequisite: A. I. 1 and 81. (3) II (Garrigus)

105 – BEEF PRODUCTION. History and importance of the beef cattle industry; selection, breeding, feeding and management of beef cattle. Lecture, 2 hours; laboratory, 2 hours.

Prerequisite: A. I. 1 and 81. (3) II (Garrigus)

106 – PORK PRODUCTION. History and importance of the swine industry; selection, breeding, feeding, and management of swine. Lecture, 2 hours; laboratory, 2 hours.

Prerequisite: A. I. 1 and 81. (3) I, II (Barnhart)

108 — MEAT JUDGING. Intensive instruction in the evaluation of carcasses and cuts of beef, veal, pork, and lamb. Laboratory, 2 hours.
Prerequisite: A. I. 6. (1) I (Wilford)

109a-c — SPECIAL PROBLEMS IN ANIMAL HUSBANDRY.
Prerequisite: permission of (3) I, II, S (Animal Husbandry Staff)
instructor.

200a-c — ANIMAL INDUSTRY SEMINAR. (1) I, II (Staff)

201a-c — RESEARCH IN MEATS. Problems involving original investigation.
(3) I, II, S (Wilford)

203a-c — RESEARCH IN HORSE HUSBANDRY. Problems involving original investigation.
(3) I, II, S

204a-c — RESEARCH IN SHEEP HUSBANDRY. Problems involving original investigation.
(3) I, II, S (Garrigus)

205a-c — RESEARCH IN BEEF CATTLE HUSBANDRY. Problems involving original investigation.
(3) I, II, S (Garrigus)

206a-c — RESEARCH IN SWINE HUSBANDRY. Problems involving original investigation.
(3) I, II, S (Wilford and Barnhart)

COURSES IN DAIRYING

120 — DAIRY CATTLE BREEDING. The application of genetics to present day problems of breed and herd improvement; the progeny testing of sires; type classification, selective registration; the rise and fall in popularity of prominent families and strains within the leading dairy breeds. Lecture, 2 hours; laboratory, 2 hours.

Prerequisite: A. I. 61. (3) II (Seath)

121 — DAIRY CATTLE FEEDING AND MANAGEMENT. The application of the principles of nutrition to dairy cattle feeding; current methods contributing to maximum efficiency in the production of quality dairy products on the farm. Lecture, 2 hours; laboratory, 2 hours.

Prerequisite: A. I. 81. (3) I (Seath and Elliott)

122 — ADVANCED DAIRY CATTLE JUDGING. Primarily for judging team candidates. Open only to those who have made good standings in the prerequisite courses. Lectures and laboratory by appointment.

Prerequisites: A. I. 21 and 23. (3) I (Seath)

123 — DAIRY BACTERIOLOGY. The application of bacteriological principles to the production and processing of milk and other dairy products, involving entrance of micro-organisms into dairy products, effects of their growth and methods for their control. Lectures, 2 hours.

Prerequisite: Bact. 52 or 102. (2) I (Morrison)

124 — DAIRY BACTERIOLOGY LABORATORY. Laboratory to accompany A. I. 123, Dairy Bacteriology. Laboratory, 4 hours.

Prerequisite or concurrent: A. I. 123. (2) I (Morrison)

125 — BUTTER AND ICE CREAM. The principles involved in the commercial manufacture, handling, and storage of butter and ice cream. Lecture, 3 hours; laboratory, 6 hours.

Prerequisite: A. I. 21.

(5) I (Barkman)

127 — A SURVEY OF THE DAIRY INDUSTRY. A course designed to acquaint students with research problems and methods at other institutions and with commercial dairy operations in other sections of the country. Full time for approximately two and one-half weeks.

Prerequisite: A. I. 21 or permission of instructor.

(3) S (Staff)

128 — TECHNICAL CONTROL OF DAIRY PRODUCTS. Various chemical and bacteriological tests used in the control of production or processing of dairy products. Laboratory and recitation, 6 hours.

Prerequisites: A. I. 21, 123 and 124.

(3) II (Morrison)

129a-c — SPECIAL PROBLEMS IN DAIRYING. Approval of instructor required.

(3) I, II, S (Dairy Staff)

130 — MARKET MILK. A study of problems concerning the production and processing of market milk and its related products. Lecture, 2 hours; laboratory, 3 hours.

Prerequisite: A. I. 21.

(3) II (Morrison)

131 — CHEESE-MAKING. A study of problems and practices in the manufacture and ripening of cheddar and other common types of cheese. Lecture, 2 hours; laboratory, 3 hours.

Prerequisite: A. I. 21.

(3) II (Freeman)

132 — REPRODUCTION IN DAIRY CATTLE. A study of male and female reproductive processes in dairy cattle and the application of artificial breeding to the improvement of dairy herds. Lecture, 1 hour; laboratory, 2 hours.

(2) II (Olds and Bush)

139a, b — DAIRY SEMINAR.

(1) II (Dairy Staff)

221a-c — RESEARCH IN DAIRYING. Problems involving original investigation in either dairy production or dairy manufacturing.

(3) I, II, S (Morrison)

See also A. I. 200, Animal Industry Seminar.

COURSES IN POULTRY HUSBANDRY

140 — POULTRY BREEDING. Genetic principles involved in poultry breeding; disease resistance; inheritance of egg production and related characters; development of breeding programs. Lecture, 3 hours.

Prerequisite: A. I. 41 and 61.

(3) I (Wightman)

141 — ADVANCED POULTRY PRODUCTION. Studies of control measures in poultry diseases, nutrition, marketing; flock management and replacement. Lecture, 2 hours; laboratory and demonstration, 2 hours.

Prerequisites: A. I. and 61.

(3) I (Wightman)

142 — MARKETING AND PROCESSING POULTRY PRODUCTS. Organization and functioning of markets, methods of selling, prices, and price making forces are combined with laboratory instruction in grading, packaging,

and handling poultry and eggs according to recognized commercial standards. Lecture, 1 hour; laboratory, 2 hours.

Prerequisites: A. I. 41; and M. & R. F. (2) I (Wightman and Clark)

100. This is the same course as

M. & R. F. 142.

145 - ADVANCED POULTRY JUDGING. Primarily for judging team candidates. Open only to those who have made good standings in the prerequisite courses. Lecture, 1 hour; laboratory, 4 hours.

Prerequisites: A. I. 41 and 44.

(3) I (Wightman)

146 - A SURVEY OF THE POULTRY INDUSTRY. A course designed to acquaint students with research problems and methods at other institutions and with commercial poultry operations in other sections of the country. Full time for approximately two and one-half weeks.

Prerequisite: A. I. 41 or permission of instructor.

(3) S (Staff)

149a-c - SPECIAL PROBLEMS IN POULTRY.

Prerequisite: permission of instructor.

(3) I, II, S (Wightman)

241a-c - RESEARCH IN POULTRY. Problems involving original investigation.

(3) I, II, S (Wightman)

See also A. I. 200, Animal Industry Seminar.

COURSES IN GENETICS

161 - GENETICS. Lectures of A. I. 61 and assigned readings. Primarily for graduate students. Lecture, 3 hours.

Prerequisite: at least one course in biology.

(3) I, II, S (Steele)

162 - GENETICS LABORATORY. Similar to A. I. 62 but additional work required. Primarily for graduate students. Laboratory, 2 hours. To be taken concurrently with A. I. 161, at student's option.

(1) I, II (Steele)

163 - ADVANCED GENETICS. Concerned chiefly with the physical basis of heredity, mutations and chromosomal aberrations, linkage, genetics and development, and reports on current literature. Lecture, 3 hours.

Prerequisite: A. I. 61 or 161.

(3) II (Steele)

169a-c - SPECIAL PROBLEMS IN GENETICS.

Prerequisite: permission of instructor.

(3) I, II, S (Steele)

261a-c - RESEARCH IN GENETICS. Problems involving original investigation.

(3) I, II, S (Steele)

See also A. I. 100, Animal Breeding; A. I. 120, Dairy Cattle Breeding; A. I. 140, Poultry Breeding; and A. I. 200, Animal Industry Seminar.

COURSES IN ANIMAL NUTRITION

281 - ANIMAL NUTRITION. The chemistry and physiology of animal nutrition and the nutritive requirements for growth, fattening, reproduction, lactation and other body functions. Lecture, 3 hours.

Prerequisite: Chem. 37 or equivalent.

(3) I

282 — LABORATORY METHODS IN ANIMAL NUTRITION. The use of laboratory techniques and equipment in the solution of fundamental problems of nutrition. Lecture and recitation, 1 hour; laboratory, 4 hours.

Prerequisite or concurrent: A. I. 181. (3) I

289a-c — SPECIAL PROBLEMS IN ANIMAL NUTRITION.

Prerequisite: permission of instructor. (3) I, II, S

284a-c — RESEARCH IN ANIMAL NUTRITION. Problems involving original investigation. (3) I, II, S

283 — ADVANCED ANIMAL NUTRITION. History and development of nutritional theories and techniques; a critical review of current literature. Lecture and recitation, 3 hours.

Prerequisite: A. I. 281. (3) II

See also A. I. 200, Animal Industry Seminar.

ANIMAL PATHOLOGY

101 — ANATOMY AND PHYSIOLOGY OF DOMESTIC ANIMALS. Correlation of structure and function of the organs and systems of the animal body; a study of anatomy and physiology as related to work offered in courses in livestock judging, animal nutrition, butchering, animal breeding, infectious diseases and animal hygiene. Lectures, 3 hours. (3) I (Brown)

102 — INFECTIOUS DISEASES OF DOMESTIC ANIMALS. Distribution, general nature, manner of dissemination, method of control, prevention and eradication of infectious and parasitic diseases of animals. Lecture, 3 hours.

Prerequisites: A. P. 101 and permission of instructor. (3) II (Hull)

104a, b — SPECIAL PROBLEMS IN ANIMAL PATHOLOGY.

Prerequisites: A. P. 101, and 102, (3) I, II (Hull, Brown)
and permission of instructor.

201a, b — INVESTIGATIONS IN ANIMAL DISEASES. This course is open only to persons who have a degree in veterinary medicine.

Prerequisites: A. P. 101, and 102, or equivalent. (3) I, II (Hull, Brown)

ECONOMIC AND SOCIAL ASPECTS OF AGRICULTURE

Courses are offered in the fields of agricultural economics and of rural sociology leading to the degrees of Master of Science, Master of Science in Agriculture and Doctor of Philosophy. Courses in the Department of Farm Economics, the Department of Markets and Rural Finance and the Department of Rural Sociology will be included in the major requirements for these degrees with consent of the major advisor.

ECONOMIC ASPECTS OF AGRICULTURE

Courses are offered in the fields of agricultural economics and of markets leading to the degrees of Master of Science, Master of Science in Agriculture and Doctor of Philosophy. Courses in the Department of Farm Economics, the Department of Markets and Rural Finance will be included in the major requirements for these degrees with consent of the major advisor.

FARM ECONOMICS

110 — FARM MANAGEMENT. A study of organizing and managing farms. Factors affecting farm earnings. Individual farm organization and farm management problem assignments assist students in learning to apply the principles of business to farms.

Prerequisite: Farm Economics 1.

(3) I, II, S (Bradford)

111 — ADVANCED FARM MANAGEMENT. A fuller study of the principles of farm management considered in course 110. Current and recent literature of farm organization and management will be studied and some consideration given to farm management as observed in European countries when such has a bearing on management principles in this country. Course fee \$15.00.

Prerequisites: Farm Economics 110 and permission of instructor.

(3) I (Johnson)

112a-c — SPECIAL PROBLEMS IN FARM MANAGEMENT. Students are assigned a special problem in the field of farm economics.

Prerequisites: Farm Economics 110 and permission of instructor.

(3 ea.) I, II, S (Nicholls)

113 — TYPES AND SYSTEMS OF FARMING. A critical study of the business organization and management of successful Kentucky farms. Several field trips will be made to farms whose operators have achieved outstanding financial success while at the same time maintaining or increasing productivity of their farms. Course fee \$20.00.

Prerequisites: Farm Economics 110 and permission of instructor.

(3) II (Nicholls)

115 — FARM ACCOUNTING. A study of farm records and farm accounts including farm cost accounting.

Prerequisite: Farm Economics 110.

(3) II (Bradford)

120 — LAND ECONOMICS. A critical examination of the utilization of land resources in relationship to present and prospective needs. The course is developed around the topics of land utilization, reclamation, land classification, soil conservation, drainage, flood control and the institutional aspects of land management, taxation and land tenure.

Prerequisite: Farm Economics 1 or permission of instructor.

(3) II (McComas)

121 — LAND-USE PLANNING. A study of the national needs and national policies which led to the land-use pattern; social and economic implications of the present destruction and loss of soil resources; contribution and limitations of land-use planning toward the development of socially desirable programs for the use of natural resources.

Prerequisite: Farm Economics 120 or permission of instructor.

(3) II (McComas)

122 — LAND VALUE AND APPRAISAL. The capitalization process, and other devices for valuing farm land; appraisal procedures of the Federal Land Banks and of other credit institutions. Course fee \$10.00.

Prerequisite: Farm Economics 120.

(3) II (Nicholls)

130 — PRODUCTION ECONOMICS. Economic analysis of agricultural production. A theoretical treatment of land rents, land returns, capital returns, costs and similar functions of agricultural production.
Prerequisite: Farm Economics 110. (3) I, S (Bradford)

200a, b — AGRICULTURAL ECONOMICS SEMINAR. Discussions and papers on methods, problems, current literature and research in the field of agricultural economics. Required of all graduate students in the department.
(1) I, II (Staff)

201a-c — RESEARCH IN FARM ECONOMICS. Assignment of an advanced problem in the field of farm economics. Stress is placed on the plan, technique, and scientific method used by the student in developing his research.
Prerequisite: permission of instructor. (3 ea.) I, II, S (Nicholls and Staff)

202a, b — ECONOMICS OF PRODUCTION AS APPLIED TO AGRICULTURE. This course places emphasis upon the fundamental considerations essential to the study of production organization in the economy of modern agriculture. Both static and dynamic theoretical analysis will be applied to such questions as the combination of the agents of production, scale and intensity of production, comparative advantage and inter-regional analysis, the function of management, profits, and to an evaluation of national agricultural policies and programs.
Prerequisite: permission of professor. (3 ea.) I, II (Johnson)

203 — COST, PRICE, AND PRODUCTION RELATIONSHIPS IN AGRICULTURE. Consideration is given to the different concepts of cost which are encountered in the agricultural research field; considerable attention is paid the applicability of the traditional cost-price rationale in the agricultural industry.
Prerequisite: permission of instructor. (3) II, S (Johnson)

204 — RESEARCH METHODS IN FARM ECONOMICS. An analytical examination of research methods and techniques used in farm management research. Topics include enterprise cost studies, detailed cost route method, experimental research method, statistical or comparative method, work simplification and methods of collecting information to be analyzed.
Prerequisites: Farm Economics 110 (3) II (McComas)
and permission of instructor.

FARM ENGINEERING

101a-c — SPECIAL PROBLEMS. This course is designed to permit advanced students to make an intensive study of some phase of agricultural engineering in which they are particularly interested.
Prerequisites: F. E. 1 and permission of instructor. (2) I, II, S (Staff)

102 — DAIRY ENGINEERING. A study of the engineering principles involved in the construction, installation, operation, and management of machinery and equipment used in the handling and manufacturing of dairy products. Lecture and recitation 2 hours.
Prerequisite: F. E. 1. (2) II (Kelley)

104 — RURAL ELECTRIFICATION. This course is designed to give students information on how to obtain electric service and on the problems involved in the selection, operation, and care of electrical equipment in the home and on the farm. Lecture and recitation, 2 hours. (2) II (Kelley)

105 — ENGINEERING PRACTICES IN WATER MANAGEMENT. Surveying, mapping, and determining areas of farm land; designing farm drainage systems; farm reservoirs; problems in controlling water erosion with terraces and other mechanical structures. Lecture, 1 hour; laboratory, 4 hours.

(3) II (Kelley)

HOME ECONOMICS

Courses in Foods and Nutrition

101 — PRINCIPLES OF NUTRITION. A non-technical course that treats of the essentials of adequate diet for optimum health, food plans to meet nutritional needs, and environmental factors which affect nutrition. Lecture, 3 hours.

Not open to home economics majors.

(3) II, S (Clemmons)

102 — DIETETICS. Daily food requirements at different age levels, emphasis being given to satisfying the divergent needs of families and other groups. Practice is given in normal dietaries. Lecture, 2 hours; laboratory, 3 hours.

Prerequisites: H. E. 6 and 11.

(3) I, II, S (Clemmons)

103a, b — PUBLIC SCHOOL NUTRITION. Study of nutrition education movement with emphasis on causes and effects of malnutrition, method of judging nutrition and standards of nutritional status. Development of health programs in public schools. Lecture, 1 hour; laboratory, 2 hours.

Prerequisite or concurrent: H. E. 102.

(3) I, II, S (Wooldridge)

105a-c — EXPERIMENTAL COOKERY. Study of factors that affect the results obtained in cooking and food preparation processes. Experimental work is carried out under controlled conditions and special emphasis is placed on physical, chemical and mechanical conditions. Lecture, 1 hour; laboratory, 4 hours.

Prerequisites: Chem. 37, H. E. 5 or permission of instructor.

(3) I, II, S (Wooldridge)

106a-c — FIELD WORK IN NUTRITION. Nutrition problems at different age levels with emphasis on the child in the public school, correlated with surveys and experimental studies to show the relation between diet selection and its physical and mental effects. Lecture and laboratory.

Prerequisites: H. E. 103a or 103b, or permission of instructor.

(1) I, II, S (Wooldridge)

107 — WORKSHOP IN NUTRITION. This workshop gives opportunity to workers in the field of nutrition to obtain help in presenting community nutrition programs. The nutrition problem is analyzed in its relation to agricultural and socio-economic problems. The latest findings in technical information on nutrition are presented. Opportunity is given to collect visual aid material for teaching nutrition.

(4) Alternate S (Erikson)

108a-c — SEMINAR IN NUTRITION. Investigations of recent research in nutrition.

Prerequisite: senior or graduate standing. (1) I, II, S (Erikson)

111 — ADVANCED NUTRITION. Application of biochemistry to understanding of characteristic properties of body cell structure and the utilization of nutrients for bodily processes. Laboratory work includes analysis of digestive juices, blood and urine and balance experiments. Lecture, 2 hours; laboratory, 4 hours.

Prerequisite: H. E. 11. (4) I, (Erikson)

112 — NUTRITION IN DISEASE. Metabolic processes of the body in normal and diseased conditions, correlating the metabolic changes due to disease with diet therapy. Practice is given in planning, calculating and preparation of therapeutic diets. Lecture, 2 hours; laboratory, 4 hours.

Prerequisites or concurrent: H. E. 102 and 111. (4) I (Erikson)

114 — FOOD PRESERVATION. The principles of preserving food by canning, drying, pickling, salting and quick freezing. Practice in the canning of fruits, vegetables and meats; the pickling of fruits and vegetables; the making of jams, jellies and preserves; brining, drying and freezing of fruits, vegetables and meats.

Prerequisites: Bact. 52 and H. E. 5. (3) II, S (Helton)

119a-c — SPECIAL PROBLEMS IN FOODS AND NUTRITION. Intensive work on a specific phase of the field.

Prerequisite: senior or graduate standing. (2) I, II (Erikson and Wooldridge)

206a-c — ADVANCED FIELD WORK IN NUTRITION. The course is a continuation of H. E. 106a-c with investigations of recent research in the field. Lecture and laboratory.

Prerequisites: H. E. 103 and 106a, or permission of instructor. (1) I, II, S (Wooldridge)

208a-c — SEMINAR IN NUTRITION. (2) I (Erikson)

219a-c — SPECIAL PROBLEMS IN FOODS AND NUTRITION. Independent advanced work on a specific problem.

Prerequisite: graduate standing. (2) I, II (Erikson and Wooldridge)

Courses in Clothing, Textiles, and Related Art

125 — ADVANCED TEXTILES. Individual term problems. Lecture, 1 hour; laboratory, 2 hours.

Prerequisites: H. E. 25 and 161. (2) I, Alternate S (Guenther)

126 — COSTUME DESIGN. The arts of costume today and throughout the past. Costumes are designed to meet today's needs. Lecture, 1 hour; laboratory, 4 hours.

Prerequisites: H. E. 27; Hum. D; and Art 30. (3) I, Alternate S (Parks)

127 — ADVANCED CLOTHING. A creative approach to costume problems is encouraged. Values in both individually made and ready-to-wear clothes are analyzed. Costumes are designed and constructed—giving as wide experience as possible with various techniques of pattern making, of construction and of fitting. Lecture, 1 hour; laboratory, 4 hours.

Prerequisite: H. E. 27.

(3) I, II, Alternate S (Parks and Guenther)

128a-c — SPECIAL PROBLEMS IN CLOTHING AND COSTUME DESIGN. Intensive work on specific phases of the field.

Prerequisite: senior or

graduate standing.

(2) I, II, S (Parks and Guenther)

129 — INTERIOR DECORATION. A study of color, line, and texture as they are used to create effective interiors suited to modern living. Lecture, 1 hour; laboratory, 4 hours.

Prerequisites: H. E. 25 and 61; Hum. D;

Art 30; and permission of instructor.

(3) II, Alternate S (Parks)

130 — INTERIOR DECORATION PROJECTS. Selected projects in furnishing the home, including furniture refinishing, upholstering and slip cover making. Costs in terms of time and money are considered. Laboratory, 4 hours.

Prerequisite: H. E. 129.

(2) II, Alternate S (Parks)

134 — ECONOMICS OF CLOTHING. The economic aspects of clothing are emphasized—budgeting and buying clothes for the family, how the clothing industry operates, the influence of the consumer, the part the clothing trades play in the national and world economy. Lecture, 1 hour; laboratory, 2 hours.

Prerequisites: H. E. 127 and 161.

(2) II, Alternate S (Guenther)

135 — DECORATIVE TEXTILES. Survey of decorative textiles through the ages, with emphasis on the modern use of fabrics. Opportunity is given to use various techniques in applying design to fabrics. Lecture, 1 hour; laboratory, 2 hours.

Prerequisite: H. E. 25, and Hum.D. and Art 30.

(2) II, Alternate S
(Guenther)

136a-c — SPECIAL PROBLEMS IN TEXTILES. Intensive work on specific phases of the field. Senior or graduating standing.

(2) I, II, S (Guenther)

138a-c — SPECIAL PROBLEMS IN INTERIOR DECORATION. Intensive work on specific phases of the field.

Prerequisite: senior or graduate standing.

(2) I, II (Parks)

139 — ADVANCED INTERIOR DECORATION. The art of interior decoration throughout the past and today. A series of interiors are planned to meet today's needs. Lecture, 1 hour; laboratory, 2 hours.

Prerequisite: H. E. 129.

(2) II, Alternate S (Parks)

228a-c — SPECIAL PROBLEMS IN CLOTHING AND COSTUME DESIGN. Independent advanced work on a specific problem. Graduate standing.

(2) I, II, S (Parks and Guenther)

236a-c — SPECIAL PROBLEMS IN TEXTILES. Independent advanced work on a specific problem. Graduate standing.

(2) I, II, S (Guenther)

237a-c — SEMINAR IN TEXTILES AND CLOTHING OR COSTUME OR INTERIOR DECORATION. Investigation of special textile, clothing, costume design or interior decoration problems. Lecture, 2 hours.

(2) I, II (Parks and Guenther)

238a-c — SPECIAL PROBLEMS IN INTERIOR DECORATION. Independent, advanced work on a specific problem.

Prerequisite: graduate standing.

(2) I, II, S (Parks)

Courses in Institution Management

140 — THE SCHOOL LUNCH. Designed for those teachers who manage the lunchroom in connection with teaching. The importance of the lunchroom to the school health program, the opportunities of the lunchroom as a teaching unit and as a community co-operative project. Duties of the manager in formulating employment policies and personnel management. Consideration will be given to the selection, arrangement, maintenance and care of equipment; the planning of menus, the purchase, storage, preparation and serving of food; the records necessary for financial control. A study of the Federal School Lunch Program and ways in which a state may participate will be emphasized. Lecture, 2 hours; laboratory, 2 hours.

Prerequisites: H. E. 5 and Econ. 1.

(3) I, S (Helton)

141 — INSTITUTION ORGANIZATION AND MANAGEMENT. Principles of institution organization, types of institution service, personnel and financial management. Methods of accounting used in institutions. Legal aspects of institution management. Personal and professional qualifications of an institution manager.

Prerequisites: H. E. 41 and 42.

(3) II (Helton)

142a-c — INSTITUTION ADMINISTRATION. Application of scientific principles of institution management. Practice is given in office management in different food units on the campus. Lecture, 1 hour; laboratory, 4 hours.

Prerequisite: H. E. 141.

(2) I, II, S (Helton)

143 — INSTITUTION EQUIPMENT. Selection, arrangement, cost and care of institution equipment. Problems of lighting, heating, ventilation and refrigeration. Two all day field trips taken to neighboring cities to equipment houses and installations. Lecture, 2 hours; laboratory, 2 hours.

Prerequisite: H. E. 42.

(3) II (Helton)

149a-c — SPECIAL PROBLEMS IN INSTITUTION MANAGEMENT. Intensive work on specific problems. Senior or graduate standing.

(2) I, II (Helton)

249a-c — SPECIAL PROBLEMS IN INSTITUTION MANAGEMENT. Independent, advanced work. Graduate standing.

(2) I, II (Helton)

Courses in Child Development

150 — TECHNIQUES OF GUIDANCE FOR THE PRESCHOOL CHILD. An opportunity for advanced work in child development. Extensive laboratory assistance in the nursery school is required with emphasis on specific guidance techniques to foster the child's growth in independence and general physical and social development. Lecture, 2 hours; laboratory, 4 hours.

Prerequisite: H. E. 152.

(4) I, II (Mumford)

152 – CHILD CARE AND DEVELOPMENT. Opportunity for gaining better understanding of young children through study of the normal development, care and guidance of the preschool child – two to five years of age. Laboratory work consists of observation and participation in nursery school. Attendance at parent meetings is required. Lecture, 2 hours; laboratory, 4 hours.

Prerequisites: A. & P. 5; *Psych.* 7; *H. E.* 52.

(3) I, II (Bentley)

154 – FAMILY LIVING. The relationships of community and family living. Emphasis is given to the influence of home conditions on the members of the family and preparation for marriage and parenthood. Lecture, 4 hours and occasional field trips in the local community. (4) II, S (Mumford)

155 – THE CHILD AND HIS CLOTHING. A study of the appreciation of the needs in children's clothing, the physiological and psychological functions, as well as the selection, cost and care of children's clothing. Lectures and laboratory. (3) S (Mumford)

156 – PLAY AND PLAY MATERIALS. Typical play activities of young children and characteristics of good play materials. Emphasis is given to the relationship of play equipment to the development of preschool children. Criteria for selection and construction of toys, including survey of inexpensive materials for home-made toys. Toys suitable for the child of preschool age are constructed in laboratory. Lectures and laboratory. (2) S (Bentley)

157 – INFANT DEVELOPMENT. Study of the development of the child in the pre-natal and infant periods. Consideration is given to the pre-natal factors that affect the child's development, such as heredity, the anatomy and physiology of reproduction, pre-natal nutrition of both the mother and the fetus. The neo-natal period includes study of sleep, emotion, motor activities, vocalization of the infant and infant feeding. Field trips are required. Lecture, 2 hours.

Prerequisite: A. & P. 5.

(2) S (Bentley)

158 – FOOD FOR CHILDREN. Application of principles of nutrition in selection, preparation and serving of foods to preschool children. Laboratory practice in observation and guidance of the child during the noon meal is offered with consideration of the psychological aspects involved. Lecture, one hour; laboratory, four hours.

Prerequisites: *H. E.* 6, 11 and 52. (3) II, S (Nutrition Staff and Mumford)

159a-c – SPECIAL PROBLEMS IN CHILD DEVELOPMENT AND FAMILY LIVING. (2) I, II (Mumford and Bentley)

259a-c – SPECIAL PROBLEMS IN CHILD DEVELOPMENT AND FAMILY LIVING. (2) I, II (Mumford and Bentley)

Courses in Home Management

161 – CONSUMER PROBLEMS. A study of consumer buying and its social and economic aspects. An analysis of the common problems of the manufacturer, the merchant and the consumer in order to understand better the needs and responsibilities of each group. Lecture, 3 hours.

Prerequisite: *Econ.* 1; and *H. E.* 61.

(3) II, Alternate S (Wilmore)

162a — HOME MANAGEMENT AND FAMILY RELATIONSHIPS. The philosophy and principles of home management. A study of the management of resources available to the family for optimal development. Includes study of the mechanics of time, energy and money management. Emphasis is placed on personal development, social and family relationships. Lecture, 2 hours.
Prerequisites: Econ. 1; and H. E. 61. (2) I, II, S (Wilmore)

162b — HOME MANAGEMENT AND FAMILY RELATIONSHIPS. A residence period in the University Home Management House is required of all seniors in home economics. The course consists of laboratory work affording experience in the application of principles presented in other courses.
Prerequisite: H. E. 162a; (3) I, II, S (Wilmore)
prerequisite or concurrent, H. E. 102.

169a-c — SPECIAL PROBLEMS IN HOME MANAGEMENT.
 (2) I, II (Wilmore)

262 — ADVANCED HOME MANAGEMENT AND FAMILY RELATIONSHIPS. A course affording opportunity for special study of social and economic problems affecting family life. Lecture, 3 hours.
Prerequisite: H. E. 162b. (3) II (Wilmore)

269a-c — SPECIAL PROBLEMS IN HOME MANAGEMENT.
 (2) I, II (Wilmore)

General Courses

175 — RURAL COMMUNITY ANALYSIS. The nature of the town-country-community and a study of programs for its development and the correlation of activities. Residence in a rural community during a part of the semester affords for those students for which it is possible laboratory experience in the application of principles developed during the period of residence in the college.
Prerequisites: an introductory course and permission of instructor. (3) I, II (Bauder)

HOME ECONOMICS EDUCATION (See Education)

HORTICULTURE

102 — PRINCIPLES OF SPRAY PRACTICE. A study of the principles and practice of spraying for the control of pests of horticultural crops. Lecture, one hour; laboratory, two hours, first half; lecture, two hours a week, last half.
Prerequisites: Hort. 1; Chem. 4a; and Agr. Ent. 1. (2) I (Waltman)

103 — POMOLOGY. Pome Fruits. A course dealing with the theory and practice of commercial pome fruit production, with major emphasis on apple growing. Lectures, 2 hours; laboratory, 2 hours.
Prerequisite: Horticulture 1. (3) I (Waltman)

104 — POMOLOGY. Stone Fruits. A detailed study of commercial peach, plum and cherry growing, with special emphasis on peach production. Lectures, 2 hours; laboratory, 2 hours.
Prerequisite: Horticulture 1. (3) I (Waltman)

105 — POMOLOGY. Small Fruits. A detailed study of the care and management of commercial plantings of strawberries, raspberries, and other bush fruits. Lectures, 1 hour; laboratory, 2 hours, first half; lectures, 2 hours a week, last half.

Prerequisite: Horticulture 1.

(2) I (Waltman)

106a-c — SPECIAL PROBLEMS IN POMOLOGY. This course is designed to meet the need for advanced work.

Prerequisites: Horticulture 1, 103, 104, 105, and permission of instructor.

(3) I, II (Waltman)

110 — PRINCIPLES OF VEGETABLE GARDENING. A study of fundamental principles underlying commercial production of vegetables. Lectures, 2 hours; laboratory, 2 hours.

Prerequisites: Horticulture 1; and Agronomy 10.

(3) I (Emmert)

111 — GROWING VEGETABLE PLANTS UNDER GLASS. Production of vegetable plants grown for transplanting; types of hotbeds, cold frames, and simple greenhouse structures. Lectures, 2 hours; laboratory, 2 hours.

Prerequisite: Horticulture 110.

(3) I (Emmert)

112a-c — SPECIAL PROBLEMS IN VEGETABLE CROPS. This course is designed to meet the need for advanced work.

Prerequisites: Horticulture 1 and 110; and permission of instructor.

(3) I, II (Emmert)

120 — LANDSCAPE GARDENING. The adaptation of principles of landscape architecture; including the coordination of buildings with surroundings; identification and uses of decorative materials and their requirements. Lectures, 2 hours; laboratory, 2 hours. Offered 1951 and on alternate years thereafter, and every summer.

Prerequisites: Horticulture 1; and Botany 1 and 2.

(3) II, S (Elliott)

121 — ADVANCED LANDSCAPE. A continuation of Horticulture 120, with special emphasis on design and use of materials. Lectures, 2 hours; laboratory, 2 hours. Offered 1950 and on alternate years thereafter.

Prerequisite: Horticulture 120.

(3) II (Elliott)

122 — FLORICULTURE. A detailed study of specific groups of flowers such as bulbs, iris, and roses. Lectures, 2 hours. Offered 1951 and on alternate years thereafter.

Prerequisite: Horticulture 22.

(2) II (Elliott)

123 — PLANT PROPAGATION. A detailed study of the methods of propagating certain horticultural plants. Includes, cuttings, grafting, and budding. Lectures, 2 hours; laboratory, 2 hours. Offered 1950 and on alternate years thereafter.

Prerequisites: Horticulture 1 and 120; and Botany 1 and 2.

(3) II (Elliott)

124a-c — SPECIAL PROBLEMS IN ORNAMENTAL HORTICULTURE. This course is designed to meet the need for advanced work.

Prerequisites: Horticulture 1, 120, 121; Botany 1 and 2; and permission of instructor.

(3) I, II (Elliott)

125 — PLANTS AND PLANTING MATERIALS. A study of woody and herbaceous plants, their identification, suitability for landscape uses and the effects produced. Lectures, 1 hour; laboratory, 2 hours. Offered 1951 and on alternate years thereafter.

Prerequisite: Horticulture 120 or permission of instructor. (2) II (Elliott)

200a-c — SEMINAR.

(1) I, II (Olney and Staff)

201a-c — RESEARCH IN HORTICULTURE.

Prerequisite: permission of instructor.

(3) I, II (Olney and Staff)

FORESTRY

110 — WOOD IDENTIFICATION AND TECHNOLOGY. General anatomy of wood, identification of commercial species of the United States based on gross and microscopic features. Properties and uses. Lectures, 2 hours; laboratory, 2 hours.

Prerequisites: Forestry 1 or 2; Botany 1; and permission of instructor.

(3) I (Davenport)

111 — LUMBER AND OTHER FOREST PRODUCTS. Manufacture, grading, and seasoning of lumber. Forest products other than logs or lumber, their methods of utilization and markets. Lectures, 3 hours.

Prerequisites: Forestry 1 or 2 and permission of instructor.

(3) II (Davenport)

120a-c — SPECIAL PROBLEMS IN FORESTRY. This course is designed to meet the need for advanced work.

Prerequisites: Forestry 110 and 111 and permission of instructor.

(3) I, II, S (Davenport)

MARKETS AND RURAL FINANCE

100 — AGRICULTURAL MARKETING. Principles and methods of marketing farm products, methods of marketing at country and central markets; classes and functions of middlemen; marketing specific commodities; market prices; marketing costs; and cooperative marketing. Lecture and recitation, 3 hours.

Prerequisite: Farm Economics 1.

(3) I, II, S (H. B. Clark, Vennes)

101 — COOPERATIVE MARKETING. Principles, methods, and problems involved in the cooperative marketing of farm products, and the purchase of farm production supplies; legal organization and management problems which cooperatives encounter. Lecture and recitation, 3 hours.

Prerequisite: Markets and Rural Finance 100.

(3) II (H. B. Clark)

102a — MARKETING TOBACCO AND OTHER FARM CROPS. Principles, methods and problems in marketing farm crops, with special emphasis on marketing tobacco, including systems of marketing, organization of markets, functional problems of warehousing, efficiency in pricing, monopoly aspects of competition and international movement of grains and tobacco. Lecture and recitation, two hours.

Prerequisite: Markets and Rural Finance 100.

(2) I, S (C. M. Clark)

102b — MARKETING TOBACCO AND OTHER FARM CROPS. Principles, procedures and problems in establishing market standards with special emphasis on tobacco, including practice in grading tobacco. Intensive two and one-half week course.

Prerequisite or concurrent: Markets and Rural Finance 102a or permission of instructor. (1) S (C. M. Clark)

103 — MARKETING LIVESTOCK AND LIVESTOCK PRODUCTS. Analysis of livestock and dairy markets, market organization, market agencies, market institutions, market services and public regulation. Lecture and recitation, 2 hours.

Prerequisite: Markets and Rural Finance 100. (2) II (Brown)

110 — AGRICULTURAL PRICES. Price behavior among agricultural products. Seasonal, cyclical and longtime trends; supply-price relationships; price movements during inflation and deflation; relation of agriculture to the general price level and factors affecting commodity prices. Lecture and recitation, 3 hours.

Prerequisite: Farm Economics 1. (3) II, S (Card, H. B. Clark)

120 — AGRICULTURAL FINANCE. Credit needs of agriculture, including short-time, intermediate, and farm mortgage credit requirements; problems of financing farm ownership and production and marketing of farm products; organization and operation of various types of credit agencies including the Farm Credit Administration. Lecture and recitation, 2 hours.

Prerequisite: Farm Economics 1. (2) I (C. M. Clark)

130 — AGRICULTURAL STATISTICS. Principles and methods involved in the analysis, interpretation, and use of agricultural statistics; the measurement or relationships by tabular analysis, gross correlation and graphic correlation; sampling, standard errors, and simple analysis of variance, as used in agricultural research. Lecture and recitation, 3 hours.

(3) I (H. B. Clark)

140 — AGRICULTURAL POLICY. Development of principles underlying agricultural policy, including analysis of the place of agriculture in the national economy, objectives of agricultural policy, recent developments in agriculture, appraisal of current and proposed agricultural programs, and legislation for remedial action. Lecture and recitation, 3 hours.

Prerequisite: Markets and Rural Finance 100. (3) I (Price)

142 — MARKETING AND PROCESSING POULTRY. Organization and functioning of markets for poultry and eggs, methods of selling, prices and price making forces are combined with laboratory instruction in grading, packaging and handling poultry and eggs according to recognized commercial standards. Lecture, 1 hour; laboratory, 2 hours.

Prerequisites: Animal Industry 41; and Markets and Rural Finance 100. (This is same course as Animal Industry 142.) (2) I (H. B. Clark, Wightman)

200a-c — AGRICULTURAL ECONOMICS SEMINAR. Analysis of current problems in the field of marketing and rural finance.

(1) I, II (Brown and Staff)

202a-c — SPECIAL PROBLEMS IN MARKETING AND RURAL FINANCE. Open to graduate students who have the necessary training* and

ability to do research on individual problems. The course consists of individual work on some selected problem related to agricultural marketing or agricultural finance.

Prerequisite: permission of head of department. (3) I, II, S (Brown and Staff)

204 — RESEARCH IN MARKETING. A critical examination of methods, objectives and results in various types of research in marketing organization, marketing functions and market management. Lecture, 3 hours.
Prerequisite: Markets and Rural Finance 100. (3) I (Price)

210 — THEORY OF AGRICULTURAL PRICES. The application of economic theory to the field of agricultural prices. Variability and flexibility in the price structure in terms of price behavior. Attention will be given to the economic aspects of certain of the price plans in agriculture. Lecture, 3 hours.
Prerequisite: Markets and Rural Finance 110 or permission of instructor. (3) II (Brown)

230a — STATISTICS FOR AGRICULTURAL RESEARCH: SOCIAL SCIENCES. Multiple, partial, and joint correlation in agricultural research; measures of seasonal variation; agricultural index numbers; theory and practice of sampling methods; and tests of significance. Lecture, 3 hours.
Prerequisite: Markets and Rural Finance 130. (3) II (Card)

230b — STATISTICS FOR AGRICULTURAL RESEARCH: PLANT AND ANIMAL SCIENCES. Analysis of variance and covariance; statistical considerations in the design of experiments; tests of significance and confidence limits. Lecture and laboratory, 3 hours.
Prerequisite: Markets and Rural Finance 130. (2) II (Card)

RURAL SOCIOLOGY

115 — ORGANIZATION OF RURAL GROUPS. A study of the dynamics of organized groups; leadership, membership participation, and program planning in agricultural organizations and other organized rural groups.
Prerequisite: an introductory course or permission of instructor. (3) II, S (Bauder)

125 — RURAL MOVEMENTS AND SOCIAL POLICY. A study of social factors involved in selected rural movements. Emphasis will be put upon the social needs in response to which the movements arose, the organization and development of the movements, and their influence upon state and federal policy.
Prerequisite: an introductory course or permission of instructor. (3) I (Brown)

160 — RURAL COMMUNITY ANALYSIS. The nature of the town-country community and a study of programs for its development and the correlation of activities. Residence in a rural community during a part of the semester affords for those students for which it is possible laboratory experience in the application of principles developed during the period of residence in the college.
Prerequisite: an introductory course or permission of instructor. (3) I, II (Bauder)

180 — ADVANCED RURAL SOCIOLOGY. Selected historical factors in rural life in the United States; rural-urban differences; social differentiation, stratification, social processes. Each student applies the principles of the course in the analysis of a selected community.

Prerequisite: an introductory course or permission of instructor.

(3) I, S (Brown)

190a-c — SPECIAL PROBLEMS IN RURAL LIFE. Supervised individual study in selected sub-fields of rural sociology. Population, standards of living, neighborhood and community change, and rural institutions are among the available fields for investigation.

Prerequisite: an introductory course or permission of instructor.

(2) I, II (Staff)

200a-c — RESEARCH IN RURAL SOCIOLOGY. Individual graduate research with correlated study of rural social research types and methods.

Prerequisite: introductory course in statistics.

(2) I, II, S (Staff)

210 — SEMINAR IN RURAL ORGANIZATION. Basic theories of social organization, comparative study of selected systems of rural social organization; examples of purposeful organization.

Prerequisite: permission of instructor.

(3) I (Beers)

220 — SEMINAR IN RURAL ATTITUDES. The nature and genesis of rural attitudes and their relation to rural social control; analysis of contemporary rural attitudes and opinion.

Prerequisite: permission of instructor.

(3) II (Bauder)

230 — RURAL URBAN RELATIONS. Study of the interdependence of city and country; solidary and antagonistic relationships of city and country; the process of urbanization, and problems of rural adjustment to urban influences.

Prerequisite: permission of instructor.

(3) I

250 — TOPICAL SEMINAR. Analysis of topics of scientific interest in rural sociology, selected from such fields as the following: criticism of contemporary research; sociological factors in land use; migration; rural social ecology of the South; highland societies; sociography of rural groups.

Prerequisite: permission of instructor.

(3) II (Staff)

SOCIOLOGY (See Social Sciences)

VI. EDUCATION

GENERAL STATEMENT OF REGULATIONS GOVERNING GRADUATE WORK IN THE COLLEGE OF EDUCATION

Work leading to the doctoral degree with a major in education must conform to the same rules and regulations as prescribed in the general requirements, pages 13-16 of this Bulletin. In addition, two other requirements are prescribed by the College of Education for all doctoral candidates. First, students must be in full-time residence for at least one regular semester, and preferably one full year, during the course of their work at the University. Second, no person will be considered as a candidate for the doctoral degree with a major in education unless he has completed three years of successful teaching experience.

There are two plans of work leading toward the degree of Master of Arts in Education. Plan II, which follows, is permissible only with the approval of the Graduate School and the Dean of the College of Education.

Plan I

1. A minimum of 24 semester hours of graduate work must be completed and a thesis must be presented.
2. At least 12 semester hours of graduate work must be in education.
3. At least 12 semester hours of graduate work must be in courses numbered 200 or higher.
4. At least 36 weeks must be spent in residence at the University of Kentucky as a graduate student.
5. At least one summer term shall be spent by the student in full residence at the University of Kentucky.
6. The total number of credits presented in education, undergraduate and graduate, must be at least 30 semester hours.
7. A standing of 2.0 (an average of B) or better must be made on all graduate work.
8. Eight semester hours and twelve weeks of residence may be done with the permission of the student's adviser and the dean of the Graduate School in extension classes or in off campus study.

Plan II

1. A minimum of 30 semester hours of graduate work must be completed.
2. At least 12 semester hours of graduate work must be in education.
3. At least 12 semester hours must be in courses numbered 200 or higher.
4. At least 36 weeks must be spent in residence at the University of Kentucky as a graduate student.
5. At least one summer term shall be spent by the student in full residence at the University of Kentucky.
6. The total number of credits presented in education, undergraduate and graduate, must be at least 30 semester hours.

7. A standing of 2.0 (an average of B) or better must be made on all graduate work.
8. Ten semester hours and 12 weeks of residence may be done with the permission of the student's adviser and the dean of the Graduate School in extension classes or in off-campus study.

Each student's graduate curriculum must be a well-rounded program of courses related to the student's major interest and approved by his committee. In cases of deficient preparation the committee, with the approval of the Dean, determines prerequisite undergraduate courses to be taken. The following committees have been designated to guide graduate students in their work toward the master's degree in education:

Area	Committee
Elementary Teachers	Duncan, Ginger, Harris
Secondary Teachers	
General	Hartford, Sorenson, Adams, Ginger
Agriculture	Hammonds, Tabb, Wall
Art	Ginger, Haines, Rannels, Fitz
Business Education	Musselman, Thomas, Humphreys
Home Economics	Parker, Sneed
Industrial Education	Baker, Crumpton, Yourmans
Music	Hornowski, Lewis, Ginger
Physical Education	Ginger, Seaton, Clay
Elementary Principal	Duncan, Harris, Ginger
Secondary Principal	Hartford, Williams, Meece
Supervisor	Duncan, Williams, Adams
Attendance Officer	Meece, Sorenson, Williams
Superintendent	Meece, Sorenson, Williams

SUGGESTED GRADUATE CURRICULA

For Superintendents

		Semester Hours
Ed 201	Foundations in Education	5
Ed 202	Local School Administration	3
Ed 221a, b	Seminar in Administration	3 (each)
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
Ed 231	Business Administration and Finance of Public Education	3
Ed 232	High School Administration	3
Ed 245	Organization of Audio-Visual Aids	3

For Principals

Ed 201	Foundations in Education	5
Ed 212	The Elementary School	3
Ed 214	The Secondary School	3
Ed 225	Supervision of Instruction	3
Ed 229	The Elementary Principal	3
Ed 232	High School Administration	3
Ed 255a	Guidance and Counseling in Today's Schools	3

For Supervisors and Helping Teachers

Ed 201	Foundations in Education	5
Ed 212	The Elementary School	3
Ed 214	The Secondary School	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
Ed 292a, b	Field Problems in Curriculum and Supervision (each)	3

For Critic Teachers on the Elementary Level

Ed 201	Foundations in Education	5
Ed 212	The Elementary School	3
Ed 224	Organization and Supervision of Student Teaching	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3

For Critic Teachers on the Secondary Level

Ed 201	Foundations in Education	5
Ed 214	The Secondary School	3
Ed 224	Organization and Supervision of Student Teaching	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 232	High School Administration	3

For High School Teachers Majoring in Education

Ed 201	Foundations in Education	5
Ed 214	The Secondary School	3
Ed 227	Principles of Curriculum Construction	3
Ed 254	Problems in Educational Psychology	3
Ed 255a	Guidance and Counseling in Today's Schools	3

For Elementary Teachers Majoring in Education

Ed 201	Foundations in Education	5
Ed 212	The Elementary School	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
Ed 254	Problems in Educational Psychology	3

For Music Majors

Ed 201	Foundations in Education	5
Ed 251	Problems in Public School and Community Music	2
Ed 252	Field Problems in Music	2
Ed 253	Independent Work in Music Education	3
Ed 254	Problems in Educational Psychology	3

For Business Education Majors

Ed 201	Foundations in Education	5
Ed 208a	Problems in Business Education	3
Ed 255a	Guidance and Counseling in Today's Schools	3
Ed 256	The Social Business Subjects in High School	3
Ed 257a	Seminar in Business Education	3
Ed 259	The Commerce Curriculum	3
Ed 271	Administration and Supervision of Business Education	3

For Agricultural Education Majors

Ed 201	Foundations in Education	5
Ed 214	The Secondary School.....	3
Ed 227	Principles of Curriculum Construction	3
Ed 280	Method in Teaching Vocational Agriculture	3
Ed 287b	Selecting Teaching Materials	3
Ed 287c	Adult-Farmer Schools	3
Ed 287d	Directing Farm Practice	3
Ed 287f	Young-Farmer Schools	3

For Home Economics Education Majors

Ed 261	Supervision in Home Economics Education	3
	(For Supervision of Student Teachers)	
Ed 263	Current Problems in Home Economics Education	3
Ed 264	Modern Trends in Home Economics Education	3
Ed 268	Home Economics Curriculum Construction	3
Ed 269	Evaluation in Home Economics Education	3
Ed 265		
or 222	Research in Home Economics Education	3

For Industrial Education Majors

Ed 171a, b	Principles and Philosophy of Industrial Education	(each) 3
Ed 123	Vocational Guidance	3
Ed 183a, b	Methods in Industrial Education	(each) 3
Ed 134	Organization and Operation of Part-Time and Evening Classes	3
Ed 214	The Secondary School	3
Ed 201	Foundations in Education	5
Ed 232	High School Administration	3
Ed 227	Principles of Curriculum Construction	3

GRADUATE COURSES IN EDUCATION**DIVISION OF ADMINISTRATION**

101 – SCHOOL ORGANIZATION. A course designed to familiarize the prospective teacher with the organization for the support and control of public education and with the administrative relationships and duties of the teacher. Topics emphasized are administrative control, personnel administration, salary schedules, community relationships, professional organizations, and professional ethics.
(3) I, II, S (Meece)

198 – THE ADMINISTRATION OF PUPIL PERSONNEL. A course designed primarily for prospective superintendents and attendance officers. Topics include theory and development of compulsory attendance, philosophy of educational rights, child accounting, duties and relationships of the attendance officer, and the use of community resources in improving attendance.
(3) S (Williams and Meece)

202 – LOCAL SCHOOL ADMINISTRATION. Public school administration for the prospective superintendent of a county or city school system. The course deals with the state as an educational agency, the local school district, the board of education, the superintendent, the internal organization for the administration of a school system, problems of the teaching personnel, problems

of pupil personnel, business management, finance and accounting, the curriculum, school building planning and management, and the supervision of instruction. This is one of the basic courses in school administration and should be taken at or near the beginning of the student's graduate program.

(3) I, S (Williams, Meece)

203 — CONSTITUTIONAL AND LEGAL BASIS OF PUBLIC SCHOOL ADMINISTRATION. A study of court decisions, to discover the legal principles involved in practical problems of school administration. Topics discussed are: the school and the state, school districts, school officers, relations of school districts and municipalities, authority of school districts and district officers, school board procedure and records, tort liability of school districts, personal liability of school officers, contractual authority and liability of boards of education, school money, the school debt, acquisition and use of school property, employment and dismissal of teachers, school attendance, rules and regulations of school boards, discipline and punishment of pupils, textbooks and studies.

Prerequisite: Education 202, 213, or 232.

(3) II (Meece)

207 — SCHOOL BUILDINGS AND EQUIPMENT. Measurement and evaluation of existing building facilities, planning new school buildings, financing the building program, building operation and maintenance.

Prerequisite: Education 202 or equivalent.

(3) (Williams)

210a, b — INDEPENDENT WORK IN SCHOOL ADMINISTRATION. For students who have completed at least one semester of graduate work in education and who present an acceptable plan for the study of a practical problem or a particular phase of school administration. Approval of the instructor must be secured prior to registration.

(3) I, II (Staff)

213 — STATE SCHOOL ADMINISTRATION. The administration of American education from the standpoint of the federal and state governments. The course deals with federal relations to education, the state as an educational agency, local units for the administration of education, the scope of the school system, state school support, state control of the material environment and equipment, the training and certification of teachers, and teachers' contracts, tenure, and retirement.

(2) S (Meece)

221a, b — SEMINAR IN ADMINISTRATION. A critical study of selected problems in school administration. The course is designed primarily for students who have had some administrative experience.

Prerequisites: Education 202 and (3) II, S (Williams, Meece)

225 or equivalent.

231 — BUSINESS ADMINISTRATION AND FINANCE OF PUBLIC EDUCATION. A specialized course for prospective superintendents. The course emphasizes the following aspects of school administration: the organization for business management; principles and procedures in the management of and accounting for school funds and school property; payroll procedure, purchasing, management, and accounting for supplies, textbooks, and equipment; school support, including state, local, and federal revenues; budgetary policy and procedure; school costs; indebtedness; and records and reports in the field of business management and finance.

(3) II, S (Meece)

233 — THE ADMINISTRATION OF TEACHING PERSONNEL. A specialized course in school administration, primarily for prospective super-

intendents. The course emphasizes principles and practices in teacher preparation, teacher selection and placement, measurement of teaching efficiency, salaries, tenure, retirement, teaching loads, sick leave and related problems, and personnel records.
(3) (Williams)

238 — TRENDS IN HIGHER EDUCATION. A survey of modern tendencies in American higher education in the following areas: scope and development, objectives, organization, administration, curricula, finance, faculty and student personnel. The course is designed to serve the needs of present and prospective college administrators and teachers and others interested in developments in higher education. For those desiring special instruction in the work of the registrar a program of laboratory work will be arranged.

(3) (Chamberlain)

276 — ADMINISTRATIVE PROBLEMS IN TODAY'S EDUCATION. Present-day problems of persons in administrative positions in public education. The course is designed to be of assistance particularly to superintendents of schools.
(3) (Williams and Meece)

290a, b — TECHNIQUE AND PROFESSIONAL WORK OF THE REGISTRAR. A comprehensive study of permanent records and transcripts, including the history, literature, and present day tendencies; rules of the American Association of Collegiate Registrars; special problems in the administration of the office.
(3) I, II, S (Sprowles)

301a, b — RESEARCH PROBLEMS IN EDUCATIONAL ADMINISTRATION. An independent research course. Students confer individually with the instructor.

Prerequisite: one year of graduate work.

(3) I, II, S (Williams, Meece)

321a, b — RESEARCH PROBLEMS IN HIGHER EDUCATION. An independent research course. Students confer individually with the instructor.

Prerequisite: one year of graduate work.

(3) I, II, S (Dickey, Chamberlain)

DIVISION OF FOUNDATIONS OF EDUCATION

119 — THE ELEMENTARY SCHOOL PUPIL. The psychology of the child in the primary and intermediate grades.

Prerequisite: one semester of psychology.

(2) I, S (Sorenson and McMillian)

122 — EDUCATIONAL TESTS AND MEASUREMENTS. The problems of measurement in the school program, with special emphasis on standardized tests. The construction and use of new-type tests, use and limitations of traditional examinations, marking systems, etc., are also considered.

(3) I, S (Sorenson and McMillian)

147 — THE SECONDARY SCHOOL PUPIL. The psychology of the pupil in junior and senior high school.

Prerequisite: one semester of psychology. (2) II, S (Sorenson, McMillian, Reed, and Myers)

200a, b — PHILOSOPHY OF EDUCATION. An advanced course dealing with the philosophy of democratic education and applications to some of the larger educational problems of today.
Prerequisite: 12 semester hours in Education. (3) I, II (Hartford)

201 — FOUNDATIONS IN EDUCATION. A required course for all graduate students in education. Utilizes findings from the fields which contribute to an understanding of the development of the individual-in-society and social inter-action. (5) I, S (Hartford, Sorenson)

205 — REVIEW OF CURRENT EDUCATIONAL LITERATURE. An extensive study of current educational literature as found in educational periodicals.
Prerequisite: 12 semester hours in Education. (3) II, S (Hartford)

217 — GENERAL HISTORY OF EDUCATION. A survey of the history of education from the Greek period to the present. (3) (Hartford)

218 — HISTORY OF EDUCATION IN THE UNITED STATES. A history of the growth and development of education in the United States from earliest Colonial times to the present, including recent movements and trends. (3) (Hartford)

219 — HISTORY OF EDUCATIONAL THOUGHT. A study of the lives and writings of the world's educators to acquaint the student with the ideals and contributions to society of great educators. (3) I, S (Hartford)

220 — COMPARATIVE EDUCATION. Comparisons of modern national systems of education. (3) II, S (Hartford)

222 — METHODOLOGY OF EDUCATION RESEARCH. A course intended to acquaint the student with the various techniques of research and to aid him in methods of attack on his own particular research problems.
Prerequisite: 12 semester hours in Education. (3) II (Sorenson)

223 — EDUCATIONAL STATISTICS. A study of the applications of statistical and graphical methods to educational data. (3) I (Sorenson)

228a, b — SEMINAR IN EDUCATION. A course planned for graduate students majoring in education, given under the direction of the faculty of the College of Education. (1) I, II (Hartford and Staff)

230 — EDUCATIONAL SOCIOLOGY. The sociological foundations of education. Topics include: the role of the school and contributions of non-school educative agencies, home-schol-community relationships, social factors affecting child development, social needs as foundations of school curricula and adult education programs, and the application of sociological findings to the field of education. (3) II, S (Hartford)

237a, b — INDEPENDENT WORK IN HISTORY OF EDUCATION. Independent work problems and topics for advanced students in history of education. (3) I, II, S (Hartford)

247a, b — INDEPENDENT WORK IN PHILOSOPHY OF EDUCATION. An independent work course for students who have done a minimum of 12 semester hours of graduate work, including Education 200a, b, 219, and 230. (3) I, II, S (Hartford)

254 – PROBLEMS IN EDUCATIONAL PSYCHOLOGY. A critical survey of the conflicting schools of psychology, theories of learning, etc.
Prerequisite: one year of psychology. (3) II, S (Sorenson)

255a, b – GUIDANCE AND COUNSELING IN TODAY'S SCHOOLS. A course for superintendents, principals, teachers, counselors, and others who have the responsibility of carrying out an effective program of guidance in the public schools. The course deals with principles and techniques for the formulation and evaluation of a complete guidance program including inventories, counseling, placement, and follow-up. (3) S (Staff)

258a, b – INDEPENDENT WORK IN EDUCATIONAL PSYCHOLOGY. An independent work course for students who have done a minimum of 12 semester hours of graduate work including Education 122, 147, or 254. (3) I, II, S (Sorenson)

260 – PROBLEMS IN EDUCATIONAL SOCIOLOGY. An advanced course in the application of sociological findings to educational problems. Special emphasis is placed upon problems and potentialities of the Southern region with implications for education. Open to students who have done a minimum of 12 semester hours of graduate work, including Education 230. (3) (Hartford)

DIVISION OF INSTRUCTION AND PLACEMENT

BUSINESS EDUCATION

104 – FOUNDATIONS OF BUSINESS EDUCATION IN THE HIGH SCHOOL. The origin, status, and objectives of business education in the secondary school. Required of business education majors. (3) I (Musselman)

158a – TEACHING SECRETARIAL SUBJECTS. Special techniques and devices for teaching shorthand, typewriting, and secretarial office practice. Required of business education majors. (3) II, S (Musselman)

158b – TEACHING BOOKKEEPING AND ACCOUNTING. Methods, materials, and techniques used in the teaching of bookkeeping and accounting. (3) I, S (Musselman)

184 – TEACHING OFFICE APPLIANCES. Methods and materials used in teaching the various office appliances. Dictating machines, mimeographs, mimeoscopes, addressing machines, filing devices, calculating machines, and other office appliances are used. (2) II, S (Musselman)

192 – TEACHING GENERAL BUSINESS SUBJECTS IN THE SECONDARY SCHOOLS. The aims and purposes of the general business courses are studied. Analysis is made of the objectives of the general business subjects, and methods and materials used in teaching them are emphasized. (2) II, S (Musselman)

194 – TEACHING CONSUMER COURSES IN THE HIGH SCHOOL. Methods, materials, and techniques of teaching high school pupils the various aspects of consumer education. The student should have a background of training in economics before taking the course. (3) I, S (Musselman)

208a-d – PROBLEMS IN BUSINESS EDUCATION. Advanced problems in the field. The type of problems considered is influenced by the interests and needs of the group. Some of these problems are: testing in business subjects, extracurricular activities in commerce, job studies, placement and follow-up type of equipment, and supervision. (3) I, II, S (Musselman)

256 – THE SOCIAL BUSINESS SUBJECTS IN HIGH SCHOOL. An examination of the various social business subjects to determine their contribution to the objectives of business education. (3) I (Musselman)

257a, b – SEMINAR IN BUSINESS EDUCATION. A study of current literature in business education with special reference to trends in this field. (1) I, II, S (Musselman)

259 – THE COMMERCE CURRICULUM. A study of business subjects offered in the high school to determine their content and the place each should occupy in high school curricula. A course of study is developed for each subject. (3) II, S (Musselman)

270 – BUSINESS EDUCATION IN COLLEGES AND UNIVERSITIES. A survey of business education in public and private colleges, and universities. Emphasis is placed upon a consideration of the problems pertaining to the teaching of business subjects at the college level. Consideration is also given to the development of curricula which will meet teacher certification requirements in the various states. (3) S (Musselman)

271 – ADMINISTRATION AND SUPERVISION OF BUSINESS EDUCATION. Duties and responsibilities of city and state supervisors, department heads, and others engaged in directing business education. (3) II, S (Musselman)

272a, b – INDEPENDENT WORK IN BUSINESS EDUCATION. An independent work course for students who have done a minimum of 12 semester hours of graduate work, one-half of which must have been in business education. (3) I, II, S (Musselman)

273 – CLASSIFICATION AND POSSIBLE USE OF COMMUNITY RESOURCES IN BUSINESS EDUCATION. Course provides for community analysis, and the development of possible ways and means to supplement the business education course in the secondary school with a study of vital community resources. (3) I, S (Musselman)

CURRICULUM AND INSTRUCTION

107 – SAFETY EDUCATION. A course designed to present the techniques and skills necessary to further automobile and pedestrian safety. The following aspects of safety are included in the course: engineering, training in developing proper attitudes toward safety, common safety laws, enforcement problems and practices, and the techniques for furthering correct driving practice. Many problems are presented as they relate to the total picture of home and school safety, as well as highway and pedestrian safety. (3) S (Ginger, Myers)

127 – THE ELEMENTARY CURRICULUM. The philosophy and techniques of curriculum construction and some practical work in construction. (3) (Harris)

175a-f — MODERN EDUCATIONAL PROBLEMS. A brief survey of some of the problems in modern education. (3) (Staff)

175g — MODERN EDUCATIONAL PROBLEMS: EDUCATION OF HANDICAPPED CHILDREN. Procedures to be used in the education of children who are handicapped physically, mentally, or emotionally. Attention is given to work with individual children as well as with groups. (3) (Staff)

175i — MODERN EDUCATIONAL PROBLEMS: COMMUNITY ORGANIZATION IN ADULT EDUCATION. Problems of community organizations as they affect the adult life of citizens of the community served. (3) (Staff)

186 — VISUAL TEACHING. Methods and techniques of visual instruction. Special emphasis is placed on charts, slides, graphs, maps, still pictures, motion pictures, and other visual aids; their effective use in teaching; and the planning of outlines and lessons involving their use. Attention is given also to the administration of visual aids in the school. It is recommended that this course be taken with student teaching. (3) I, II, S (Godbey, Myers, Ginger)

206 — PROBLEMS OF COLLEGE TEACHING. Methods commonly used in college teaching, bases for measuring instruction, marking systems, qualifications for college teaching, and efforts being made to improve college instruction. (3) (Staff)

224 — ORGANIZATION AND SUPERVISION OF STUDENT TEACHING. A course planned for students preparing to do critic teaching in the fields of elementary and secondary education. It includes the basic principles underlying the entire program and deals with specific problems for critic teachers on the elementary and secondary levels. (3) II (Ginger)

225 — SUPERVISION OF INSTRUCTION. Development, purposes, and organization of supervisory programs. Special emphasis on the nature of educational leadership. Consideration of various approaches to supervision with special attention to current in-service education programs. (3) II, S (Williams and Adams)

226a-f — PROBLEMS OF THE SCHOOL CURRICULUM. Problems in the field of the school curriculum and in the preparation of instructional materials. Students enrolling in this course are required to leave on file with the College of Education a complete report of each problem studied. (3) (Staff)

227 — PRINCIPLES OF CURRICULUM CONSTRUCTION. Study of basic principles of curriculum development. Relationship of social and psychological factors to curriculum change. Survey of current approaches to curriculum organization. Consideration of means of curriculum development in school systems. (3) (Musselman and Adams)

234 — PROBLEMS OF CURRICULUM MAKING. The selection of materials in the elementary and secondary fields, the types of units used in modern instruction, how the child learns, the various educational agencies in the community, and how the school may be made a real community center. (3) I, S (Musselman)

245 — ORGANIZATION OF AUDIO-VISUAL AIDS. Beginning the audio-visual program, qualifications and duties of staff members assisting in the audio-visual program, sources, and criteria for judging equipment and supplies, the audio-visual aids budget, projection mechanics, and in-service teacher training. (3) II (Ginger)

246 — MOTION PICTURES IN EDUCATION. The history of the educational motion picture, technique in the use of films, educational scenario writing, grading and scoring films, and motion picture appreciation. (3) (Ginger)

249 — EXTRACURRICULAR ACTIVITIES. The underlying principles and common practices of extracurricular activities programs in public schools: home room activities; student councils, clubs, athletics, publications, speech and dramatics, honor societies, service clubs, commencement, and social events. Any other extracurricular activity will be discussed by the class if interest is sufficiently great to justify the time. (3) S (Staff)

292a, b — FIELD PROBLEMS IN CURRICULUM AND SUPERVISION. A course designed to provide direct experience in dealing with educational problems in field situations. Observations, readings, and research also required. Registration only with consent of instructor. (3) I, II (Dickey, Williams, and Adams)

305a, b — RESEARCH PROBLEMS IN CURRICULUM AND SUPERVISION. An independent research course. Students confer individually with the instructor. *Prerequisite: one year of graduate work* (3) I, II, S (Williams, Adams, and Dickey)

ELEMENTARY EDUCATION

110 — ART AND CRAFT ACTIVITIES IN THE ELEMENTARY SCHOOL. Planned to give the elementary teacher an understanding of teaching methods involved in, and construction of, art activities which would enrich the classroom program. (2) II (Haines)

133 — STUDENT TEACHING IN THE ELEMENTARY SCHOOL. A course designed to give the student experience with and practice in the program of a modern elementary school. (Note: the student spends from 8:00 a.m. until 2:30 p.m. in the classroom for the semester. One hour per day additional, 2:30 p.m. to 3:30 p.m., is spent in conference and discussion with the supervising teacher. The student is permitted to take one additional 3 credit course at a suitable hour. A student who has had three credits in student teaching may take this course with reduced hours and reduced credits.)

Prerequisite: Education 44 or equivalent; and senior standing in the elementary curriculum. (12) I, II, S (Ginger, and Supervising Teachers)

141 — PROBLEMS IN DIAGNOSTIC AND REMEDIAL READING. Problems of prevention, diagnostic, and remedial work in reading with demonstration of the use of instrumentation in diagnosis and correction of reading difficulties and the application of these clinical procedures to problem cases. The course includes problems of elementary and high school teachers and administrators. (3) (Duncan)

172 – THE TEACHING OF READING. A practical application of principles derived from psychology and research, with discussion of aims, primary reading and readiness, activities leading to reading, reading in the intermediate grades, oral and silent reading, phonics, diagnostic and remedial work, means of testing, and suitable materials for each grade. (3) II (Duncan)

173 – CHILDREN'S LITERATURE. Literature for children from kindergarten to Grade VI; children's interests at different ages and stages of development, story telling and dramatization; reading and book reports from various types of literature – modern fantastic tales, realistic stories, biography, folklore, myths and legends, and poetry. (3) II (Duncan)

174 – TEACHING IN THE KINDERGARTEN. The nature, development, and education of the child of kindergarten age. Organization, equipment, curriculum, and procedures used with children of this age. Students are scheduled regular periods for observing and participating in the kindergarten. (3) I (Duncan)

196 – SCIENCE IN THE ELEMENTARY SCHOOL. A background of elementary science usable with children in the first six grades. The course includes planning units of work, organizing and using materials and references, making bibliographies for teachers and children, use of illustrative materials, and excursions. (3) I (Harris)

212 – THE ELEMENTARY SCHOOL. A course designed to help the superintendent, elementary principal, and elementary supervisor in a better understanding of the modern elementary school. The objectives, research, and modern trends in the skills and content subjects of the elementary curriculum are discussed from the standpoint of supervision. (3) II (Duncan, Harris)

215a, b – INDEPENDENT WORK IN ELEMENTARY EDUCATION. An independent work course for students who have done a minimum of 12 semester hours of graduate work including Education 212 or 229. (2) I, II (Duncan, Harris)

229 – THE ELEMENTARY PRINCIPAL. Problems related to the elementary principalship; the professional preparation, selection, and status of the principal; the relation of the principal to other administrative officers, supervisors, teachers, pupils, and parents; problems of attendance, discipline, health, and records; and the application of sound principles to the improvement of teaching. Emphasis is placed on the community relationship of elementary principals and teachers and ways in which they may cooperate and improve the life of the community. Attention is given also to problems presented by members of the class. (3) I (Harris, Duncan)

308a, b – RESEARCH PROBLEMS IN ELEMENTARY EDUCATION. An independent research course. Students confer individually with the instructor. *Prerequisite: one year of graduate work.* (3) I, II (Harris)

MUSIC EDUCATION

251 – PROBLEMS IN PUBLIC SCHOOL AND COMMUNITY MUSIC. Problems in teaching, supervising, organizing, and leading public school and community music activities. Students in-service have an opportunity to bring

problems from their own school or community situations and, when possible, the instructor visits them in the field. This course includes projects, demonstrations, readings, and discussion. (2)* (Lewis, Hornowski)

252 – FIELD PROBLEMS IN MUSIC. A course designed to permit the teacher or leader in the field to work out his local problems as an independent graduate teaching project under the guidance of the music staff. (2)* (Lewis, Hornowski)

253 – INDEPENDENT WORK IN MUSIC EDUCATION. A course designed for graduate students who undertake research problems in music education, conducted in regular consultation with the instructor. (2)* (Lewis, Hornowski)

SECONDARY EDUCATION

105 – FUNDAMENTALS OF SECONDARY EDUCATION. A consideration of problems which develop in connection with student teaching at the secondary level. This course is to be taken during the same semester in which the student is engaged in student teaching. (3) I, II, S Myers, Reed)

111 – REMEDIAL READING IN THE SECONDARY SCHOOL. A study of diagnostic and remedial work with reading disability cases in the junior and senior high school. This course is designed to enable the teacher to diagnose reading difficulties and to remedy them. Observation, case studies, and practice in remedial work with children are required of all students. The course includes a critical study of the investigations and literature in the field. (2) (Duncan)

142 – STUDENT TEACHING IN ART. A course planned for teachers who contemplate becoming supervisors of art in the public schools and designed to give students experiences with teaching children in the elementary and secondary schools through the medium of art activities. Interests at different age levels are studied and art problems suitable for these levels are worked out. (8) I, II (Haines)

153 – STUDENT TEACHING IN ENGLISH.† Course of study, essentials of English, grammar, materials, methods, testing, language and composition, and literature. The course includes observation and practice in the content field. Safety education, audiovisual aids, and planning conferences with the supervising teacher are also included as a part of the student teaching program. (9) I, II, S (Anderson, Shipman)

154 – STUDENT TEACHING IN LANGUAGES.† Aims and objectives, course of study, methods, tests, equipment, and analysis of textbooks. The course includes observation and practice in the content field. Safety education, audio-visual aids, and planning conferences with the supervising teacher are also included as a part of the student teaching program. (9) I, II, S (West)

* Offered according to demand.

† Education 105 is required and Education 186 is recommended if more than one course is permitted during the student teaching semester. Special permission must be granted for more than one course.

155 – STUDENT TEACHING IN THE SCIENCES.* Aims and objectives, courses of study, methods, tests, equipment, general science, biology, physics, and chemistry. The course includes observation and practice in the content field. Safety education, audio-visual aids, and planning conferences with the supervising teacher are also included as a part of the student teaching program.
(9) I, II, S (Kemper)

156 – STUDENT TEACHING IN MATHEMATICS.* Course of study, materials, methods, and testing in Algebra I, advanced algebra, plane geometry, solid geometry, and trigonometry. The course includes observation and practice in the content field. Safety education, audio-visual aids, and planning conferences with the supervising teacher are also included as a part of the student teaching program.
(9) I, II, S (Porter)

157 – STUDENT TEACHING IN THE SOCIAL STUDIES.* Objectives, preparation of the teachers, courses of study, methods, supplementary materials, testing, and professional helps. The course includes observation and practice in the content field. Safety education, audio-visual aids, and planning conferences with the supervising teacher are also included as a part of the student teaching program.
(9) I, II, S (Peck, Shipman)

169a, b – STUDENT TEACHING IN PHYSICAL EDUCATION. A course for students who desire to become either instructors in physical education, directors of physical education, or coaches of athletics in the public schools. The student is expected to take student teaching for both semesters, and this course should be scheduled first so that proper placement will be possible. Seven hours a week are to be spent in observation, teaching, work with safety education, present use of audio-visual aids in education, and conferences with the supervising teacher.
(4) I, II (Richeson, Clay, Gilb)

177a, b – STUDENT TEACHING IN MUSIC. A course planned for teachers who expect to become either instructors or supervisors of music in the public schools. Seven hours per week in observation, teaching, work on research problems, and conferences with the supervising teacher.
(4) I, II (Stallings)

193 – STUDENT TEACHING IN BUSINESS EDUCATION.* Practice in junior business training, shorthand, typewriting, and such other commercial subjects as are commonly taught on the secondary level. The course includes observation and practice in the content field. Safety education, audio-visual aids, and planning conferences with the supervising teacher are also included as a part of the student teaching program.
(9) I, II, S (McMurtry)

214 – THE SECONDARY SCHOOL. A course designed to acquaint the secondary teacher and the administrator with the nature and function of the secondary school.
(3) I, II, S (Adams)

232 – HIGH SCHOOL ADMINISTRATION. A course designed primarily for high school principals and prospective administrators. Topics emphasized are secondary school organization, the principal, the staff, the pupil, program of studies, schedules, community relationships, records and reports, articulation, library, plant, finance, and the aims of secondary education.
(3) I, S (Williams)

* Education 105 is required and Education 186 is recommended if more than one course is permitted during the student teaching semester. Special permission must be granted for more than one course.

248a, b — INDEPENDENT WORK IN SECONDARY EDUCATION. An independent work course for students who have done a minimum of 12 semester hours of graduate work including Education 214 or 232.
(3) I, II, S (Ginger, Adams)

307a, b — RESEARCH PROBLEMS IN SECONDARY EDUCATION. An independent research course. Students confer individually with the instructor.
Prerequisite: one year of graduate work. (3) I, II, S (Ginger, Adams)

DIVISION OF VOCATIONAL EDUCATION

AGRICULTURAL EDUCATION

179 — DETERMINING CONTENT IN VOCATIONAL AGRICULTURE. Interpretation of local data as a basis for course building. Each student works out the content of a four-year course in vocational agriculture.
(3) S (Hammonds, Wall)

181 — TEACHING VOCATIONAL AGRICULTURE. Preparation for teaching of agriculture. About one-half of the course is practice.
(15) I, II (Hammonds, Binkley, Neel, Tabb, Truitt, Veal)

182 — ADULT-FARMER SCHOOLS AND YOUNG-FARMER COURSES IN AGRICULTURE. A general introduction to adult-farmer schools and young-farmer courses with some observation of work in both of these fields.
(3) I, II (Hammonds)

185a-d — PROBLEMS IN AGRICULTURAL EDUCATION. Class work on current problems in agricultural education common to special groups of students (not individual-problem work).
(3) I, II, S (Hammonds, Tabb, Wall)

188 — FARM PRACTICE SUPERVISION. Practice and directed study in supervising farming programs in vocational agriculture.
(1) I, II, S (Hammonds, Tabb)

280 — METHOD IN TEACHING VOCATIONAL AGRICULTURE. The principles of method applied to the teaching of agriculture.
Prerequisite: experience in teaching vocational agriculture. (3) S (Hammonds)

281 — TEACHING PREVOCATIONAL AGRICULTURE. Aims, purposes, and methods of teaching prevocational agriculture. Each student works out the content of a course, including selecting the teaching materials.
(3) (Hammonds)

285a-d — MODERN PROBLEMS IN AGRICULTURAL EDUCATION. Class work (not individual-problem work) on modern problems in agricultural education.
(3) I, II, S (Hammonds, Tabb)

287a — ADVANCED PROBLEMS IN AGRICULTURAL EDUCATION. Specific problems selected according to the needs of the individuals.
(3) I, II, S (Hammonds, Armstrong, Tabb)

287b — SELECTING TEACHING MATERIALS. Selection of specific references and other teaching materials to be used in the teaching of vocational agriculture. (3) S (Wall)

287c — ADULT-FARMER SCHOOLS. Preparation for teaching adult farmers; organization of adult-farmer schools, curriculum content, method of teaching, and follow-up work. (3) S (Ttabb)

287d — DIRECTING FARM PRACTICE. Supervised farming as a method of teaching; standards, planning, supervision, and records. (3) S (Hammonds)

287e — TEACHING FARM SHOP. A study of necessary content for shop, plans for securing and equipping the shop, and methods of teaching farm shop. (3) S (Tabb)

287f — YOUNG-FARMER SCHOOLS. Content and method of teaching young-farmer courses in vocational agriculture. (3) S (Hammonds, Armstrong)

289a, b — RESEARCH IN AGRICULTURAL EDUCATION. Individual problems of importance to agricultural education. (3) I, II, S (Hammonds, Armstrong, Tabb)

DISTRIBUTIVE EDUCATION

112 — DETERMINING TEACHING CONTENT IN DISTRIBUTIVE EDUCATION. Course construction in the field of distributive education. This course is planned to meet the needs of persons engaged as instructors in the field of distributive education. (3) I, II, S (Baker)

115a, b — PROBLEMS IN DISTRIBUTIVE EDUCATION. Problems in teaching vocational distributive education in day, part-time, and evening schools. The problems are selected in accordance with the needs and desires of the students.
Prerequisites: Education 112 and 128. (3) I, II, S (Baker)

116 — PROBLEMS OF THE COORDINATOR IN DISTRIBUTIVE EDUCATION. Problems facing the coordinator as he acts in the capacity of intermediary between the school and the business world. Problems in placing students in stores, in follow-up methods, in store contacts, and in securing the cooperation of personnel management are discussed. (3) I, II, S (Baker)

128 — TECHNIQUE OF TEACHING DISTRIBUTIVE EDUCATION. A study of the methods of teaching as applied to distributive education. The purpose of the course is to train prospective teachers to teach in the field of distributive education. (3) I, II, S (Baker)

HOME ECONOMICS EDUCATION

160 — TECHNIQUE OF TEACHING HOME ECONOMICS. A study of methods of teaching as applied to home economics.
Prerequisites: Home Economics 26, 27, and 61; and Education 147. (3) I, II (Parker)

162 — STUDENT TEACHING IN HOME ECONOMICS. Practical application of methods in teaching various phases of home economics.

Prerequisite: Education 160.

(6) I, II (Parker, Averitt,
Monical, Smith, Sneed)

165 — ADULT EDUCATION IN HOME ECONOMICS. Problems in teaching vocational homemaking in day, part-time, and evening schools.

Prerequisite: Education 160. Prerequisite or concurrent: Education 162.

(3) I, II, S (Parker, Averitt,
Monical, Smith, Sneed)

166a-d — PROBLEMS IN HOME ECONOMICS EDUCATION. Problems in teaching home economics for high school students and adults. The course may include such subjects as teaching in, and supervision of, the school community cannery and the teaching of housing.

(3) S (Parker, Sneed)

261 — HOME ECONOMICS SUPERVISION. A course planned primarily to help prepare teacher-trainers and supervisors of home economics education.

Prerequisites: Education 160 and 162;

(3) I, S (Parker)

experience in teaching; and permission of instructor.

263 — CURRENT PROBLEMS IN HOME ECONOMICS EDUCATION. Recent developments in home economics education.

Prerequisite: Education 160 and 162;

(3) II, S (Parker, Sneed)

experience in teaching.

264 — MODERN TRENDS IN HOME ECONOMICS EDUCATION. A basic course for graduate students in home economics education. It is designed to acquaint students with modern trends in education. Some problems considered are the contribution of home economics to the general education of boys and girls, research in home economics education.

(3) I, S (Parker)

265a, b — INDEPENDENT WORK IN HOME ECONOMICS EDUCATION. An independent work course for students who have done at least 12 semester hours of graduate work, one course of which must have been in home economics education.

(3) I, II, S (Parker)

266a-c — SEMINAR IN HOME ECONOMICS EDUCATION. Individual investigations and reports on special problems in home economics education.

(3) I, II, S (Parker)

267 — DIRECTED SUPERVISION IN HOME ECONOMICS EDUCATION. Teaching home economics classes for observation, directing student teachers under the guidance of a supervising teacher, visiting schools with the itinerant teacher-trainer in different sections of the state, and organizing teaching materials. (This course may be taken parallel to or following Education 261.)

*Prerequisites: two years teaching experience;
permission of the Department of
Home Economics Education.*

(3) I, II (Parker)

268 — HOME ECONOMICS CURRICULUM CONSTRUCTION. A study of the underlying principles of curriculum building for junior and senior high school and adult education in home economics.

Prerequisites: Education 160 and 162.

(3) S (Parker, Sneed)

269 — EVALUATION IN HOME ECONOMICS EDUCATION. A course to acquaint teachers of home economics with techniques used in measuring attainment in home economics in the junior and senior high school and college.

Prerequisite: teaching experience.

(3) I, S (Parker)

INDUSTRIAL EDUCATION

123 — VOCATIONAL GUIDANCE. A course designed to give teachers, principals, and superintendents a comprehensive view of the factors in vocational guidance and of the agencies contributing to or influencing life choices, and an analysis of the human and economic resources of a given civic unit.

(2) (Crumpton, Youmans)

134 — ORGANIZATION AND OPERATION OF PART-TIME AND EVENING CLASSES. A course for administrators, coordinators, and teachers in part-time and evening industrial education. Covers the duties of a coordinator in cooperative training programs.

(2) I, II, S (Crumpton, Youmans)

136 — SURVEYS IN INDUSTRIAL EDUCATION. Techniques and methods for making various types of surveys to determine needs for vocational training in trades and industries. Forms, questionnaires, outlines, interviews and conferences are studied as means of evaluating the effectiveness of industrial education programs.

(2) I, II, S (Crumpton, Youmans)

137 — SPECIAL PROBLEMS IN INDUSTRIAL EDUCATION. The supervised study of approved problems in industrial education on a research basis.

(2) I, II, S (Crumpton, Youmans)

143 — MODERN INDUSTRIAL ANALYSIS. Modern industrial organizations; trends in industrial educational policies; the proper approach to and analysis of these problems as they affect the industrial vocational teacher.

(2) I, II, S (Crumpton, Youmans)

171a, b — PRINCIPLES AND PHILOSOPHY OF INDUSTRIAL EDUCATION. A course planned primarily for the advanced student in industrial education. It covers the general philosophy of vocational education as it relates to the problems and principles of industrial education.

(2) I, II, S (Crumpton, Youmans)

183a, b — METHODS IN INDUSTRIAL EDUCATION. The most approved methods in instructional management, including lesson planning, in the field of vocational industrial education.

(2) S (Crumpton, Youmans)

VOCATIONAL EDUCATION

211 — THE ADMINISTRATION OF VOCATIONAL EDUCATION. A course designed for superintendents and for principals of high schools. The purpose of the course is to train for administering and supervising vocational education. Topics emphasized include aims and purposes of vocational education, relationship of vocational to other education, financing vocational education, and relationship of local to state administration.

(3) I, II (Hammonds, Armstrong)

282 – SPECIAL PROBLEMS IN VOCATIONAL EDUCATION. An independent work course for students interested in vocational education. Students make individual investigations and report on special problems.

(3) I, II, S (Hammonds and Staff)

PHYSICAL EDUCATION

The Physical Education Department offers graduate work toward the degree of Master of Arts or the degree of Master of Science. The degree of Master of Arts in Education may be obtained with the elective courses taken in physical education. In this case the requirements as set out on page 120 must be met. Requirements for the degree of Master of Arts or Master of Science are stated on page 9.

COURSES FOR MEN AND WOMEN OPEN TO UPPER DIVISION AND GRADUATE STUDENTS

140 – ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION. Policies and procedures of administration on the secondary school and collegiate levels. Special emphasis on construction and care of facilities, equipment and supervision of personnel. Three hours per week.

(3) I, S – odd years (Clay, Carr)

141 – COACHING ADVANCED BASKETBALL. Lecture and recitation on the theory and practice of team play in basketball. Special emphasis is placed upon systems of offense and defense as used by the leading coaches throughout the country. Two hours per week. During summer school the course is offered in the coaching school short course.

Prerequisite: Physical Education 41.

(2) I, S (Rupp, Clay)

142 – COACHING ADVANCED FOOTBALL. Lecture and recitation on the theory of football. Special emphasis is placed on generalship, signal systems, scouting and conditioning of players. Leading foot-ball systems are studied. Two hours per week. During summer school the course is offered in the coaching school short course.

Prerequisite: Physical Education 42 or permission of the instructor.

(2) II, S (Bryant, McCubbin)

143 – HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION. Study of the historical development of physical education and an interpretation of the biological, psychological and sociological principles of physical education. Three hours per week.

(3) II, S (Hackensmith, Carr)

144 – PHYSICAL EDUCATION IN THE SECONDARY SCHOOL. Required for teacher certification in physical education. Study of theory, practice, and methods of teaching physical education activities and supervising programs in the secondary school. Three hours per week of lecture, recitation, and visitation.

(3) II, S (Carr, Clay)

145 – INTRODUCTION TO TESTS AND MEASUREMENTS. The construction and grading of essay and objective tests; construction and analysis of achievement tests; and testing and measuring in health and physical education. Lecture two hours and laboratory two hours per week.

(3) II (Hackensmith)

158a — SPORTS OFFICIATING FOR MEN. The theory and practice of officiating football, volleyball, basketball, swimming, and other sports. Officiating in college intramurals and high school athletics will be required. One hour lecture, two hours laboratory. (1) I, S (Johnson)

158b — SPORTS OFFICIATING FOR MEN. The theory and practice of officiating basketball, track, baseball, tennis, and other sports. Officiating in college intramurals and high school athletics will be required. One hour lecture, two hours laboratory. (1) II, S (Johnson)

159a — SPORTS OFFICIATING FOR WOMEN. Instruction, interpretation of rules, and practice in officiating field hockey, volleyball, basketball, and other sports. Preparation for Women's National Officials rating in athletics. One hour lecture, two hour laboratory. (1) I, S (Carr)

159b — SPORTS OFFICIATING FOR WOMEN. Instruction, interpretation of rules and practice in officiating basketball, softball, tennis, and other sports. Preparation for Women's National Officials rating in athletics. One hour lecture, two hours laboratory. (1) II, S (Carr)

165 — SAFETY IN PHYSICAL EDUCATION. Designed to prepare majors to teach safety education or to serve as a school safety coordinator. Provides a knowledge of all common areas of safety education but emphasizes safety in athletics, physical education and recreation. (2) I, S — even years (Seaton)

169a, b — STUDENT TEACHING IN PHYSICAL EDUCATION. See Secondary Education, College of Education. (9) I, II (Gilb, Clay, Ginger, Seaton)

172 — KINESIOLOGY. Study of muscular and mechanical factors in bodily movements. Three hours per week lecture.

Prerequisites: Anatomy and Physiology 4 and 5. (3) I, S — odd years (Hackensmith)

173 — REMEDIAL PHYSICAL EDUCATION. A study of the prevention and treatment of physical defects. Two hours of lecture and two hours practice per week.

Prerequisite: Physical Education 172. (3) II, S — even years (Hackensmith)

174 — TECHNIQUES OF REHABILITATION. A practical course in rehabilitation techniques employed in hospitals and rehabilitation centers. Emphasis is upon the use of play and recreation as therapy for the mentally ill, handicapped, and those recuperating from temporary impairment. Four hours per week laboratory.

Prerequisite: Physical Education 173 or permission of the instructor. (2) II (Hackensmith)

180 — ORGANIZATION AND ADMINISTRATION OF RECREATION. Study of administrative policies in organizing and conducting municipal recreation and its relationship to other municipal functions, particularly the public school systems. Consideration of principles and programs of social recreation. Three hours lecture and recitation.

Prerequisite: Physical Education 80. (3) II, S — even years (Kauffman)

181 – CAMPING IN EDUCATION. Purpose, history, organization, and conduct of camps of various types.

Prerequisite: Physical Education 81 or permission of instructor.

(2) I, S (Kauffman)

182 – INTRAMURAL SPORTS. A study of the history and development of intramural sports on the elementary and secondary and college levels. Lecture, recitation, and practice in accepted methods of organizing and administering intramural sports. Three hours per week. One hour lecture and two hours laboratory.

(1) II, S – even years (McCubbin, Poe)

183 – INTERPRETATIONS OF LEISURE AND RECREATION. Designed to provide students who are interested in recreation as a profession, as an adjunct to other work, or as informed citizens, with a basic understanding of the significance of leisure and the objectives of recreation in our modern society. Problems to be investigated include: changes in our social structure resulting in the spread of leisure to all groups; the social implications of social leisure; planning recreation to achieve social goals; the role of professional, part-time, and volunteer leaders in recreation programs.

Prerequisite: Sociology 40.

(3) I, S (Kauffman)

185 – COMMERCIAL RECREATION. Designed for students who plan to become operators or owners of commercial recreation facilities. It is concerned with the socio-economic aspects of this field as well as the development of acceptable standards and techniques for the operation of such enterprises. Two hours lecture and two hours laboratory per week.

(3) II, S (Brook, Kauffman)

190 – HISTORY AND SURVEY OF DANCE. The study of the evolution of dance through the cultural periods of history and the correlation of social structure and dance forms. Open also to male students. Three hours per week.

(3) II, S – odd years (Shaw)

191 – RHYTHMICAL FORM AND ANALYSIS. A functional study of rhythm presented in relation to movement. The employment of percussion instruments and musical accompaniment for dance. Open also to male students. Three hours per week, one hour lecture and recitation, and two hours laboratory.

(2) II (Shaw)

192 – DANCE COMPOSITION. Creative composing in dance choreography and program planning. Directing, staging, costuming of dance production to be presented formally by the student. Open to male students. Two hours lecture and recitation and four hours laboratory per week.

Prerequisite: Physical Education 91.

(4) I (Shaw)

COURSES OPEN TO GRADUATE STUDENTS ONLY

240 – GRADUATE SEMINAR IN PHYSICAL EDUCATION. Required of all graduate students upon entrance. An orientation course required of graduate students with a major interest in physical education. Guidance in thesis writing and standards for publications and treatment of standards required for the preparation of papers. Two hours lecture and recitation.

(2) I, II, S (Carr, Hackensmith)

241 — CURRENT STUDIES AND TRENDS IN HEALTH AND PHYSICAL EDUCATION. A study of modern trends in health and physical education and standards of evaluation in relation to the history of the various systems including a review of the principles and objectives.

(3) II, S — even years (Seaton)

242 — PROBLEMS COURSE IN PHYSICAL EDUCATION. For school administrators and directors of physical education. Students work on individual problems applicable to their situation and interests, as well as upon general school problems. An attempt is made by the instructor to visit each student on the job and to provide guidance in his work.

(3) I, S — odd years (Seaton)

243 — PROBLEMS IN THE ADMINISTRATION OF ATHLETICS. For athletic directors, supervisors, and athletic coaches. A study of representative athletic administration procedures for colleges, public school systems, and municipal athletic leagues. Two hours per week.

(2) II, S — even years (Clay, Shively)

244 — TESTS AND MEASUREMENT IN HEALTH AND PHYSICAL EDUCATION. The theory and practice of measurement of strength, size, and maturity, power, motor educability, and agility. Tests of track and field events, general motor capacity and ability, endurance, and special abilities. Two hours lecture and two hours laboratory per week.

(3) I, S (Hackensmith)

280 — PROBLEMS IN RECREATION. A study of the cause and content of current problems in recreation. Formation of policies and consideration of research projects which would aid in the solution of these problems. Two hours lecture and recitation.

Prerequisite: Physical Education 80
or permission of the instructor.

(2) I, S — odd years (Kauffman)

290 — DANCE AND EDUCATION. The function of dance in the educational curriculum on the elementary, secondary, and college levels including teacher training and administrative problems.

Prerequisite: Physical Education 91
or equivalent.

(3) S — even years (Shaw)

VII. ENGINEERING

Prerequisites for graduate work; students desiring to take any of the following courses should have the prerequisites indicated in each case. Courses numbered 200 and above are offered to graduates and to such practicing engineers as may be qualified to pursue them. A thorough working knowledge of chemistry, physics and mathematics is necessary. For credit toward an advanced degree, a candidate must hold a baccalaureate degree in the division of engineering in which he is registered, or its equivalent.

ENGINEERING GENERAL

ENGINEERING ADMINISTRATION

102 — ENGINEERING ADMINISTRATION. A study of the methods, procedures, and principles involved in engineering analyses, contracts, specifications, estimates and valuations, and administration of engineering projects. Lecture and recitation, three hours.

Prerequisite: senior classification.

(3) I, II (Tenney)

APPLIED MECHANICS

100 — STRENGTH OF MATERIALS. A general course in the application of the principles of mechanics to the solution of problems in stress and strain due to direct forces, shear, bending, torsion, eccentric loads and combined stresses in beams, columns, thin cylinders, springs, etc. Lecture and recitation, four hours.

Prerequisites: Applied Mech. 3; and Math. 20b.

(4) I, II, S
(Hawkins, Barber, Adams, Williams)

106 — ADVANCED STRENGTH OF MATERIALS. Unsymmetrical bending of beams, bending and deflection of thin plates, stress of analysis of thick walled cylinders, and rotating discs. Theory of elastic energy and curved beams, stress concentration and fatigue. Lecture and recitation, three hours.

Prerequisite: Applied Mech. 100.

(3) I, II, S (Hawkins, Adams)

107 — MECHANICAL VIBRATIONS. Vibrations of systems of one and several degrees of freedom, balancing of rotating machines, critical speeds, and torsional and lateral vibrations of shafts. Lecture and recitation, four hours.

Prerequisites: Applied Mech. 4 or 7, and 100. (4) I, II (Hawkins, Barber)

Prerequisite or concurrent: Math. 105a.

ENGINEERING DRAWING

115 — PHOTOGRAPHY. Fundamental principles of photography. Lectures on the optics and chemistry of photography together with practical demonstrations. Negative making, printing, etc. Lecture, one hour; laboratory, four hours a week.

Prerequisites: Chem. 1a; and Physics 3a.

(3) (Nollau)

FIRE PROTECTION AND SAFETY ENGINEERING

101a — FIRE PROTECTION ENGINEERING. A series of lectures and recitations on building materials, types of construction, fire resistance and combustibility ratings, analysis of fire hazards, treatment of special hazards, preventative and protection methods including water supply, fire fighting equipment, special extinguishing devices; and rate making including methods of measuring fire hazards, town grading, inspection methods and preparation of maps and reports. Lecture and recitation, two hours a week.

Prerequisite: junior classification.

(2) I 1951-52 (Gard)

101b — FIRE PROTECTION ENGINEERING. Continuation of Fire Prot. and Safety Eng. 101a. Lecture and recitation, two hours a week.

Prerequisite: junior classification.

(2) II 1951-52 (Gard)

101c — FIRE PROTECTION ENGINEERING. Continuation of Fire Prot. and Safety Eng. 101b. Lecture and recitation, two hours a week.

Prerequisite: junior classification.

(2) I even years (Gard)

102 — SAFETY ENGINEERING. A study of safety methods including industrial accident prevention, accident data, statistics and their value, industrial safety hazards and protective equipment, plant safety programs and accident analysis, transportation and general safety. Lecture and recitation, two hours a week.

Prerequisite: junior classification.

(2) II even years (Gard)

CIVIL ENGINEERING

107 — SOIL MECHANICS. A study of soil and its utilization in foundations for structures and subgrade for highways. Stabilization and improvement of bearing values. Lectures and recitations two hours a week; laboratory, three hours.

Prerequisite: senior classification.

(3) I, II (Gregg)

110a — REINFORCED CONCRETE. Theory and design of beams, slabs, girders and columns as related to building frames, retaining walls and bridges. Lecture and recitation, three hours; drawing room, three hours.

Prerequisite: Civ. Eng. 171a.

(4) I, II (Mory)

110b — REINFORCED CONCRETE. Continuation 110a, with special emphasis on complete structures. Lecture and recitation, two hours; drawing room, three hours.

Prerequisite: Civ. Eng. 110a.

(3) I, II (Mory)

114 — ADVANCED SURVEYING. Principles of geodetic surveying as related to the establishment of control systems. Observations and calculations for determining time, azimuth, latitude and longitude. Theory and practice of mapping including stadia, plane table and photographic methods. Lecture and recitation, two hours; field work, three hours.

Prerequisite: summer camp.

(3) I, II (Shaver)

120 — HYDRAULICS. Principles of hydraulics and hydrodynamic pressure. Flow of water through orifices, nozzles, pipes, and open channels, over weirs, and against stationary and moving vanes. Loss from friction and other sources. Lecture and recitation, two hours.

Prerequisites: Applied Mech. 4 and 100.

(2) I, II (Cheek)

123 – HYDAULICS LABORATORY. Experimental investigation of flow of water in pipes, channels, over wiers, measure of friction and hydrostatic pressure, and hydraulic machinery. Laboratory, three hours.

Prerequisite or concurrent: Civ. Eng. 120.

(1) I, II (Cheek)

151 – WATER SUPPLY AND WATERWORKS. Sources of supply; rainfall, surface water, rivers, lakes, and ground water. Theory of filtration, purification, equipment, and distribution. Problems in design and construction. Lecture and recitation, two hours.

Prerequisite: Civ. Eng. 120.

(2) II (Cheek)

152 – SEWERS AND SEWAGE DISPOSAL. Sanitary and storm sewer systems, theory of design, and method of disposal. Lecture and recitation, two hours.

Prerequisite: Civ. Eng. 120.

(2) II (Cheek)

157 – SANITARY ENGINEERING FOR HEALTH OFFICERS. General principles of Sanitary Engineering, including municipal and rural sanitation, water supply, collection of waste, sewers and sewage disposal, insect control, milk sanitation, principles of heating, lighting and ventilation. Lectures, recitation and field trips, eight hours a week for eight weeks.

(2) S (Cheek)

158 – SANITARY ENGINEERING DESIGN. For students now majoring in Sanitary Engineering. Complete design and layout of a water plant, distribution system, storm and sanitary sewer, and sewage disposal plant. Drawing room, nine hours.

Prerequisites: Civ. Eng. 151 and 152.

(3) I, II (Cheek)

159 – DESIGN AND OPERATION OF WATERWORKS AND SEWERS. Investigation and partial designs of water supplies, purification plants, distribution problems, pipe networks, sewers and disposal plants. Practice covering the more common laboratory tests used in water treatment and sewage disposal plants. Laboratory and drawing room, six hours.

Prerequisites: Civ. Eng. 151 and 152.

(2) I, II (Cheek)

171a – THEORY OF STRUCTURES. Analysis of stresses in simple and indeterminate structure, including beams, girders, trusses, towers and building frames. Lecture and recitation, three hours.

Prerequisite or concurrent: Applied Mech. 100.

(3) I, II (Mory)

171b – THEORY OF STRUCTURES. Continuation of 171a with emphasis on indeterminate structures. Lecture and recitation, three hours.

Prerequisite: Civ. Eng. 171a.

(3) I, II (Mory)

173a – STEEL STRUCTURES. Design and details for various types of riveted and welded connections, riveted and welded building frames, plate girders and trusses. Lecture, one hour; drawing room, six hours.

Prerequisite: Civ. Eng. 171a.

(3) I, II (Mory)

173b – STEEL STRUCTURES. Continuation of 173a with emphasis on floor systems, trusses and plate girders for bridges. Drawing room, six hours.

Prerequisite: Civ. Eng. 173a.

(2) I, II (Mory)

174 – GRAPHIC SOLUTIONS. Analysis of stresses by graphical methods, in simple structures including, beams, girders and trusses. Design and details of timber structure. Drawing room, six hours.

Prerequisite or concurrent: Civ. Eng. 171a.

(2) I, II (Mory)

182 – SANITATION. Presented from an engineering viewpoint. Municipal and rural sanitation, treatment and protection of water supplies, disposal of refuse and sewage, control of insects, food supply, plumbing and ventilation. Lecture and recitation, two hours.

Prerequisite: Bact. 57.

(2) I, II (Cheek)

202a-d – CONSTRUCTION. Advanced work in plain and reinforced concrete. Theory, design and details for rigid buildings, bridge frames and arches. Calculation of stresses by the method of column analogy. Class work, one hour; laboratory, four hours.

(3) I, II (Mory)

221a, b – ADVANCED SOIL MECHANICS. Advanced study of the engineering properties of soils, dealing directly with flow of water through soils, stresses in earth masses, shearing resistance and conditions of failure, clay mineral content and its effect, airphoto classification of soils, and the application of these theories to the design of engineering structures. Lecture, one hour; laboratory, four hours a week.

Prerequisite: Civ. Eng. 107.

(3) I, II (Gregg)

232a-d – HIGHWAY ENGINEERING. Advanced course designed for graduate civil engineers who wish to enter the field of highway engineering. Road laws, organization of highway departments, traffic cost, contracts and specifications, and laboratory investigations on all kinds of surfacing materials. Structures, their design and maintenance. Class work, one hour, laboratory, four hours.

(3) I, II (Chambers, Gregg)

242a-d – RAILROAD ENGINEERING. Advanced course in location, construction, maintenance, economical selection of lines, grade reduction, cost of operation, valuation, and structures and their maintenance. Class work, one hour; laboratory, four hours.

(3) I, II (Shaver)

252a-d – SANITARY ENGINEERING. Advanced course in sewer design, construction and maintenance; design, maintenance, and operation of sewage disposal plants; water supply and water-works design; and construction and maintenance. (Courses in water analysis and bacteriology should be taken in connection with this course.) Class work, one hour; laboratory, four hours.

(3) I, II (Cheek)

262a-d – GEODETIC SURVEYING. Advanced course in geodetic calculations, development, and use of formulas used by the United States Coast and Geodetic Survey. Modern methods of field practice. Class work, one hour; laboratory, four hours.

(3) I, II (Shaver)

272a-d – STRUCTURAL ENGINEERING. Advanced work in structural steel. Theory, design and details of arches, continuous highway and railroad plate girders, trussed bridges and building frames. Class work, one hour; laboratory, four hours.

(3) I, II (Mory)

282a-f – SPECIAL PROBLEMS IN CIVIL ENGINEERING. Open to graduate students who have the ability to carry on research. Each course consists of individual work in one of the various fields of Civil Engineering. Laboratory, six hours a week.

Prerequisite: permission of Head of the Department.

(3) (Staff)

283a-d – SEMINAR. Review of current literature in the field of Civil Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two hours.

(1) (Staff)

ELECTRICAL ENGINEERING

101 — FUNDAMENTALS OF ELECTRICAL MACHINERY. (For Civil, Metallurgical and Mining Engineers.) A study of the more common types of D. C. and A. C. electrical equipment and machinery. Classroom, 2 hours; laboratory, 2 hours.

Prerequisite: Physics 3b.

(3) I (Staff)

102 — ELECTRICAL MACHINERY. (For Metallurgical and Mining Engineers.) A study of electric power and its control as applied to mining machinery and metallurgical processes. Classroom, 2 hours.

Prerequisite: Elec. Eng. 101.

(2) II (Bureau)

105a — ELECTRICAL ENGINEERING CIRCUITS AND MACHINERY. (For Mechanical Engineers.) Study of electrical circuits and machinery and their control as found in modernly equipped installations. Classroom, three hours; laboratory, three hours.

Prerequisites: Physics 3b; and Math. 20b.

(4) I (Staff)

105b — ELECTRICAL ENGINEERING CIRCUITS AND MACHINERY. (For Mechanical Engineers.) Continuation of Elec. Eng. 105a. Classroom, three hours; laboratory, three hours.

(4) II (Staff)

107 — ELECTRICAL CONTROLS. A study of the field of electrical engineering which is concerned with the control of electric equipment. It involves a study of the individual types of contractors, relays, etc., as well as the typical circuits with which they are tied together into units for automatic functioning. Classroom, two hours; laboratory, two hours.

Prerequisite: Elec. Eng. 116, 105b or 101.

(3) I (Noble, Maney)

108 — INDUSTRIAL ELECTRONICS. A study of electronic principles and devices for industrial use, with emphasis on control, gas diodes, thyratrons, ignitrons and their applications in the control of rectifiers, motors and welders; high frequency heating, timing circuits, trigger circuits and relaxation oscillators; phototubes and their application, etc. Lecture and recitation, 2 hours; laboratory, three hours.

Prerequisites: Elec. Eng. 116 and 161.

(3) II (Romanowitz, Smith)

110 — ELECTRICAL LABORATORY. An experimental study of electrical machinery. Lecture, 1 hour; laboratory, one three-hour period.

Prerequisite or concurrent: Elec. Eng. 116.

(2) I, II (Staff)

111 — ADVANCED ELECTRICAL LABORATORY. Continuation of Elec. Eng. 110. Laboratory, two hours.

(1) I (Staff)

114 — ALTERNATING CURRENT CIRCUITS. A mathematical study of single phase and polyphase circuits under the influence of steady state sinusoidal and non-sinusoidal voltages. Classroom, three hours; laboratory, three hours.

Prerequisites: Elec. Eng. 21; and Math. 20b.

(4) I, II (Staff)

115 — DIRECT CURRENT MACHINERY. A study of D. C. machinery construction and design, and its operation and characteristics. Classroom, two hours; laboratory and calculating room, three hours.

Prerequisites: Elec. Eng. 21; and Math. 20b.

(3) I (Staff)

116 — ALTERNATING CURRENT MACHINERY. A study of A. C. machinery construction and its operation and characteristics. Classroom, three hours; laboratory and calculating room, three hours.

Prerequisites: Elec. Eng. 114 and 115.

(4) II (Staff)

117 — ADVANCED ALTERNATING CURRENT MACHINERY. Advanced analytical study of A. C. machinery characteristics. Classroom, three hours.

Prerequisite: Elec. Eng. 116.

(3) II (Staff)

118 — ELECTRICAL POWER PLANT EQUIPMENT. A study of the electrical elements of a modern power plant and their operation and characteristics. Lecture and recitation, three hours.

Prerequisite: Elec. Eng. 116.

(3) (Staff)

120 — ELECTRICAL CIRCUIT ANALYSIS. The study of higher mathematics applied to electrical engineering problems. It includes the use of differential equations, power series, hyperbolic functions. Bessel's functions, vector analysis, etc. Classroom, three hours.

Prerequisites: Elec. Eng. 114;

(3) II (Allison, Nierenberg, Smith)

and Math. C105a.

123 — ELECTRICAL EQUIPMENT PROBLEMS. (For Electrical Engineers.) Individual problems related to engineering practice are assigned. The solutions involve economic as well as engineering considerations. A formal written report is required for each assignment. Calculating room, six hours.

Prerequisites: Elec. Eng. 116 and 120.

(2) I, II (Bureau, Nierenberg)

124 — ELECTRICAL DESIGN. This is a study of fundamental relations involved in the design of electrical machinery. Special problems are used for developing the material of this course, including the calculations for the design of several pieces of electrical equipment. Lecture, one hour; calculating room, five hours.

Prerequisites: Elec. Eng. 115 and 116.

(2) I, II (Barnett)

135 — ELECTRICAL NETWORKS. Fundamentals of network theory in communication and power circuits. Network theorems, transmission lines and wave filters. Lecture and recitation, three hours; laboratory, three hours.

Prerequisite: Elec. Eng. 114. *Concurrent:* Elec. Eng. 120. (4) I (Allison)

136 — ILLUMINATION ENGINEERING. A study of the spectral nature of light sources as it affects the illumination of surfaces and objects. Entities in the illumination system; measurements and standards; design of interior and outdoor lighting systems. Lecture and recitation, two hours; laboratory, two hours.

Prerequisites: Physics 3b; and Math. 20b.

(3) I (Maney, Noble)

137 — ELECTRIC POWER TRANSMISSION AND DISTRIBUTION. A study of the problems involved in the transmission of electric power with special emphasis on the elements of the transmission line. Classroom, three hours.

Prerequisites: Elec. Eng. 120 and 135.

(3) II (Barnett, Bureau)

139 — TELEPHONY. The theory and practice of modern telephone operation. Lecture and recitation, three hours.

Prerequisite: Elec. Eng. 135.

(3) II (Staff)

151a, b — SEMINAR. Weekly meeting with staff for reports and discussion on research and modern trends and practices in Electrical Engineering. Two hours.

Prerequisite: senior standing.

(1) I, II (Staff)

152a-c — INDEPENDENT PROBLEMS. (For Electrical Engineers.) A problem, approved by the Head of the Department, forms the background for study and research. Only students, the character of whose previous work justifies it, will be allowed to register for this work.

(2) I, II (Staff)

152d-f — INDEPENDENT PROBLEMS. (For Electrical Engineers.) A problem, approved by the Head of the Department, forms the background for study and research. Only students, the character of whose previous work justifies it, will be allowed to register for this work.

(2) I, II (Staff)

161 — ELECTRONICS. High vacuum and gas tubes, thermionic emission; elementary electronic circuits, rectifiers and smoothing filters; audio amplifiers, harmonic distortion, impedance matching; audio oscillators; use of electronic instruments. Lecture and recitation, three hours; laboratory, three hours.

Prerequisite: Elec. Eng. 114.

(4) I, II (Staff)

162 — RADIO ENGINEERING I. Push-pull audio amplifiers, plate current harmonic analysis; radio frequency oscillators and amplifiers; modulation, AM and FM; detectors and detection of AM and FM signals; the super-heterodyne receiver. Lecture and recitation, three hours; laboratory, three hours.

Prerequisite: Elec. Eng. 161.

(4) I (Farris)

164 — RADIO ENGINEERING II. High frequency measurements; coupled circuit and impedance transformation; wide-band amplifiers; pulse circuits, multivibrator, square wave testing of amplifiers; high frequency lines, stub matching.

Prerequisites: Elec. Eng. 135 and 162.

(4) II (Romanowitz, Farris)

165 — RADIO ENGINEERING — FUNDAMENTALS OF ELECTRIC WAVES. A study of fundamental theory of electric current, potential, electromagnetism and electromagnetic fields using vector analysis; introduction to Maxwell's equations; plane waves, power flow and the Poynting vector. Lecture and recitation, two hours.

Prerequisites: Elec. Eng. 114 and 120.

(2) II (Romanowitz)

206 — ELECTRIC POWER TRANSMISSION. The theory underlying the calculation and operation of long distance transmission circuits. Special attention to relay control. Recitation, three hours.

(3) (Bureau, Barnett)

210 — SYMMETRICAL COMPONENTS. A study of the symmetrical component method of analyzing unbalanced conditions on transmission lines and its use in solving relay applications. Recitation, three hours.

(3) (Bureau)

211a — LINEAR CIRCUIT ANALYSIS I. The application of the Laplace and Fourier transform methods to the analysis of linear lumped constant systems under transient and steady state conditions: feedback amplifiers; filter networks; iterative structures, etc. Stability and physical realizability, System transfer functions and network synthesis.

Prerequisites: Elec. Eng. 120 and 135.

(3) (Smith)

211b — LINEAR CIRCUIT ANALYSIS II. Continuation of 211a with an introduction to non-linear systems. (3) (Smith)

212 — SERVOMECHANISMS. Study of the synthesis of closed loop systems; transient and steady state analysis of system transfer functions. Use of Laplace transform and loci plot methods. The interrelation of transient and sine wave behavior. Lecture and recitation, three hours.

Prerequisites: Elec. Eng. 107, 108 and 211. (3) (Bureau, Smith)

221 — ELECTRON BEHAVIOR IN HIGH VACUUM AND GAS TUBES. Potential distribution, thermionic emission and electron flow; thermionic cathodes; energy of electrons in metals, temperature — energy relations and energy distributions, Maxwellian distribution equations and curves; effects of random motions of electrons and ions, equilibrium of energy transfer, the Boltzmann relation.

Prerequisites: Elec. Eng. 108. (3) (Romanowitz)

222 — GASEOUS CONDUCTING ELECTRONIC DEVICES. Atomic energies, energy level diagrams, electron motions; photo-electric emission and photo-sensitive devices; electric arcs and glow discharges, plasmas and plasma boundaries, cathode spot and cathode fall space, sheaths and probes; thyratrons, ignitrons, mercury vapor rectifiers and inverters.

Prerequisite: Elec. Eng. 221. (3) (Romanowitz)

223 — COMMUNICATION ENGINEERING — ADVANCED TRANSMISSION LINE THEORY. Open wire and coaxial lines, reflections, standing waves; circle diagram; stub matching; impedance transformation; wave guides. Continuation of Elec. Eng. 135. Lecture and recitation, three hours.

Prerequisites: Elec. Eng. 120 and 135. (3) (Romanowitz, Farris)

226 — RADIO ENGINEERING — ULTRA HIGH FREQUENCY. Generation, detection and measurement of microwave energy; vacuum tubes at ultra high frequencies, the klystron and the magnetron. Lecture and recitation, 2 hours; laboratory, three hours.

Prerequisites: Elec. Eng. 163 and 165. (3) (Romanowitz, Allison)

227 — ELECTROMAGNETIC FIELDS. Advanced studies in electric and magnetic fields, using vector methods and Maxwell's equations, wave equations, radiation and propagation of energy. A continuation of Elec. Eng. 165. Lecture and recitation, three hours.

Prerequisite: Elec. Eng. 165. (3) (Romanowitz, Allison)

230a-f — SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING. Open to graduate students who have the ability to carry on research. Each course consists of individual work in one of the various fields of electrical Engineering. Laboratory, six hours a week.

Prerequisite: permission of Head of the Department. (3) (Staff)

231a-d — SEMINAR. Review of current literature in the field of Electrical Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two hours. (1) (Staff)

MECHANICAL ENGINEERING

100a – MACHINE DESIGN. Design of machine and structural elements. Lecture and recitation, three hours.

Prerequisites: Eng. Draw. 18; and Mech. Eng. (3) I, S (Carter,

15b. *Prerequisite or concurrent:* Cannizzo, Gard)
Applied Mech. 100.

100b – MACHINE DESIGN. Continuation of 100a. Drawing room, nine hours.

Prerequisite: Mech. Eng. 100a. (3) I, II, S (Carter, Cannizzo, Gard)

104a – ENGINEERING THERMODYNAMICS. Fundamental principles of thermodynamics including the application and theory of fluid flow, engines, turbines, air compressors, refrigeration, gaseous mixtures and combustion. Lecture and recitation, three hours.

Prerequisites: Physics 3b; and Math. 20b. (3) I, S (Penrod)

104b – ENGINEERING THERMODYNAMICS. Continuation of 104a. Lecture and recitation, three hours.

Prerequisite: Mech. Eng. 104a. (3) II, S (Penrod)

105 – POWER PLANT ENGINEERING. Study of the characteristics and use of steam and diesel power plant equipment, including steam generators, fuel handling and burning equipment, coal and ash handling, draft producers, dust collectors, smoke abatement, prime movers, generators, air preheaters, economizers, feed water heating and treatment, pumps, continuous blow down, and combustion control. Lecture and recitation, three hours.

Prerequisite: Mech. Eng. 104b. (3) II, S (Willis)

107 – FLUID MECHANICS. Covering the statics, kinematics, dynamics and thermodynamics of fluids, both liquids and gases, including the derivation and use of all fundamental formula for flow through orifices, nozzles, pipes, fittings, etc., together with the study of dams, weirs, metering devices, turbines, pumps, the aerodynamics of bodies moving through air and the hydrodynamics of bodies moving through water. Lecture and recitation, three hours.

Prerequisite: Mech. Eng. 104a. (3) II (Penrod, Savage, Baker)

108 – INTERNAL COMBUSTION ENGINES. A study of internal combustion engine cycles and the characteristics and performance of actual engines, valve gears, and materials of construction. Lecture and recitation, four hours.

Prerequisite: Mech. Eng. 104b or 134. (3) II (Meyer, Beavers)

109 – REFRIGERATION. A course which deals with compression and absorption refrigeration machines in which special attention is given to properties of refrigerants, laws and properties of solutions, heat balance, heat exchangers, theory of freezing, food storage and refrigeration capacity. Lecture and recitation, three hours.

Prerequisite: Mech. Eng. 104b or 134. (3) I, S (Knight, Baker)

110 – HEATING AND VENTILATING DESIGN. Brief course for Architectural Engineers, covering the selection and layout of heating and ventilating equipment. Drawing room, three hours.

Prerequisite or concurrent: Mech. Eng. 116. (1) II (Knight, Baker)

112 – MECHANICAL LABORATORY. Practice in the operation, use, calibration, and care of mechanical and industrial test and research instruments

and apparatus, followed by a study of the methods used for the determination of certain fundamental coefficients and constants; also a study of the records and results from operating and test instruments in actual commercial use. Lecture and recitation, one hour; laboratory, three hours.

Prerequisite: Mech. Eng. 104a or 134.

(2) II, S (Staff)

113a — MECHANICAL LABORATORY. Performance tests on heating, ventilating, and power plant equipment. Lecture and recitation, one hour; laboratory, three hours.

Prerequisites: Mech. Eng. 104b and 107.

(2) I (Staff)

113b — MECHANICAL LABORATORY. Continuation of 113a. Lecture and recitation, one hour; laboratory, three hours.

Prerequisite: Mech. Eng. 113a.

(2) II (Staff)

114a — AIR CONDITIONING, HEATING AND VENTILATING. Theory of air conditioning and the mechanical equipment of buildings. Special attention is given to construction and use of psychrometric charts; heat transmission, heat and cooling load calculations, heating and cooling systems, the gas-fired air conditioner and the heat pump system. Lecture and recitation, three hours.

Prerequisite or concurrent: Mech. Eng. 109.

(3) I (Knight, Baker)

114b — AIR CONDITIONING, HEATING AND VENTILATING DESIGN. Continuation of 114a and the complete design and layout of a year-round air conditioning system. Lecture, one hour; drawing room, six hours.

Prerequisite: Mech. Eng. 114a.

(3) II (Knight, Baker)

116 — ELEMENTARY HEATING, VENTILATING AND AIR CONDITIONING. A course involving heating and ventilating calculations with descriptions of various types of equipment. Latter part of semester devoted to a discussion of the basic principles of air conditioning. Lecture and recitation, three hours.

Prerequisites: Physics 3b and

(3) II (Knight, Baker)

permission of Department.

122a — SEMINAR. Studies of current engineering literature, preparation and presentation of bibliographies and reports through the use of the Engineering Index and Industrial Arts Index. Two hours a week.

Prerequisite: permission of Department.

(1) I (Baker, Carter, Knight)

122b — SEMINAR. Continuation of 122a. Two hours a week.

Prerequisite: permission of Department.

(1) II (Baker, Carter, Knight)

129 — ELEMENTS OF HEAT TRANSFER. The transfer of heat by conduction, convection and radiation with special attention given to dimensionless ratios, film theory, heat transfer and pressure drop, and heat exchangers. Lecture and recitation, four hours.

Prerequisite: Mech. Eng. 104b.

(4) I, S (Baker, Penrod)

130 — APPLIED AERODYNAMICS. Study of the atmosphere, boundary layers, fluid mechanics principles as applied to aerodynamics, wind tunnel weighing systems, circulation theory, basic wing theory, lift and drag, compressibility, performance of propeller-engine and jet-propelled aircraft, thermodynamics principles, and stability and control of the airplane. Lecture and recitation, three hours.

Prerequisites: Mech. Eng. 104b and 107.

(3) I (Savage)

131a — AIRPLANE DESIGN. Design of a small light plane including study of basic design problems; aerodynamic factors in design, stress analysis of structures, aircraft materials, control systems, weight and balance control, engine installations, inboard profile, and cost items. Lecture and recitation, three hours.

Prerequisite or concurrent: Mech. Eng. 130a. (3) (Savage)

131b — AIRPLANE DESIGN. Continuation of 131a. Lecture and recitation, one hour; laboratory, two two-hour periods.

Prerequisite: Mech. Eng. 131a. (3) (Savage)

133 — TOOL DESIGN. An introduction to tool engineering which embodies the fundamental principles of designing jigs, fixtures, cams, gauges, punches, dies, and automatic machine tools. Lecture, one hour a week; drawing room, six hours a week.

Prerequisite: Mech. Eng. 100b. (3) I (Carter)

134 — ELEMENTS OF ENGINEERING THERMODYNAMICS. Brief course for Civil, Electrical and Mining Engineers covering the general energy equations, mixtures of gases and vapors, flow of fluids, vapor power cycles, internal combustion cycles, gas compression, and refrigeration cycles. Recitation, three hours a week.

Prerequisites: Physics 3b; and Math. 20b. (3) I (Staff)

135 — EXPERIMENTAL AERODYNAMICS. Study of basic wind tunnel design, wind tunnel support systems, velocity distribution in tunnel working sections, drag of various objects, and pressure distribution over air foils at various angles of attack. A complete wind tunnel analysis of a scale made to obtain lift, drag, pitching moment, and side force data. Lecture, one hour; laboratory, four hours.

Prerequisite: Mech. Eng. 130. (3) II (Savage)

136 — INTERNAL COMBUSTION ENGINE LABORATORY. A study of magnetos, distributors, fuel ignition, timing, carburetors, oil systems, and performance tests on engines. Aeronautical laboratory, three hours.

Prerequisites or concurrent: (1) I, II (Myer, Beavers)
Mech. Eng. 108 and 113a.

201a-d — AUTOMOTIVE ENGINEERING. An advanced course in the essentials of motor vehicle design, construction, and operation. Drafting room, laboratory, and lectures by appointment. (3) (Meyer)

202a-d — POWER PLANT ENGINEERING. Advanced work in the design, selection, layout and operation of heat-power plant equipment. (3) (Penrod, Willis)

203a — HEATING, VENTILATING, AND AIR CONDITIONING. Theoretical analysis of complex refrigeration cycles and treatment of advanced refrigeration topics; intermittent heating; advanced psychrometrics and air conditioning techniques. (3) (Baker, Knight)

203b — HEATING, VENTILATING, AND AIR CONDITIONING. Analysis of panel heating and cooling systems; theoretical development of exact radiation equations involving multiple reflections; configuration factor analysis; exact and simplified design techniques. (3) (Baker, Knight)

203c, d – HEATING, VENTILATING, AND AIR CONDITIONING. Advanced work in the design, selection, layout and operation of heating ventilating and air conditioning equipment with emphasis on industrial application and heat pump design. (3 each) (Baker, Knight)

204a-d – ADVANCED MACHINE DESIGN. The application of the principles of mechanics of materials, dynamics, and kinematics to the design of complete machines. This involves a knowledge of shop practice and methods of construction. (3) (Carter, Meyer)

210a-f – SPECIAL PROBLEMS IN MECHANICAL ENGINEERING. Open to graduate students who have the ability to carry on research. Each course consists of individual work in one of the various fields of Mechanical Engineering. Laboratory, six hours a week.
Prerequisite: permission of the Head of the Department. (3) (Staff)

211a – ADVANCED ENGINEERING THERMODYNAMICS. Critical treatment of the laws of thermodynamics, properties of gases, and vapors, temperature scales; applications of theory to compressors and internal combustion engines; frequent reference to research papers. Lecture, four hours a week.
Prerequisite: Mech. Eng. 104c or permission of the instructor. (4) I, II (Penrod)

211b – ADVANCED ENGINEERING THERMODYNAMICS. Continuation of 211a.
Prerequisite: Mech. Eng. 211a. (4) II (Penrod)

212a – ADVANCED FLUID MECHANICS. Fundamentals of hydro- and aero-mechanics treated by the use of vector and tensor calculus. Theorems in vector and tensor analysis will be developed and applied to the flow of fluids. Lecture, four hours a week.
Prerequisite: Mech. Eng. 107 or permission of instructor. (4) I (Penrod)

212b – ADVANCED FLUID MECHANICS. Continuation of 212a.
Prerequisite: Mech. Eng. 212a. (4) II (Penrod)

213a – ADVANCED HEAT TRANSFER. Application of mathematics to heat transfer, transfer of heat in heat exchangers and furnaces, heat transmission and pressure drop, discussion of research papers. Lecture, four hours a week.
Prerequisites: Mech. Eng. 107 and 129 or the equivalent. (4) I (Penrod, Baker)

213b – ADVANCED HEAT TRANSFER. Continuation of 213a.
Prerequisite: Mech. Eng. 213a. (4) II (Penrod)

214a, b – SPECIAL PROBLEMS IN AERONAUTICAL ENGINEERING. Advanced course in aircraft power plant engineering dealing with special problems in reciprocating engines, gas turbines, and jet propulsion. Aeronautical laboratory, nine hours a week.
Prerequisite: permission of the Head of the Department of Mechanical Engineering. (3) I, II (Meyer, Savage)

215a-d – SEMINAR. Review of current literature in the field of Mechanical Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two hours.
(1 ea.) (Staff)

METALLURGICAL ENGINEERING

121 — FUEL AND METALLURGICAL LABORATORY. This course comprises the analytical determination of the constituents of ores, slags and other metallurgical products by both wet and dry methods as well as the determinative methods utilized in the analysis of coals, gases and other fuels. Laboratory, six hours.

Prerequisites: Chem. 21a; and Met. Eng. 27. (2) I, II (Kendall)

128 — METALLURGY OF NON-FERROUS METALS. This course comprises a study of the principles and processes employed in the production and preparation for use of copper, lead, aluminum and other non-ferrous metals together with a consideration of the strategic and economic importance of these metals. Lecture and recitation, three hours.

Prerequisite: Met. Eng. 27. (3) I, II (Crouse)

132 — METALLURGICAL CALCULATIONS. This course comprises a study of the calculations involved in the practical application of metallurgical principles both general and specific. Recitation and problems, five hours.

Prerequisites: Chem. 21a, Met. Eng. 29 and 128. (5) I, II (Crouse)

140 — THE SCIENCE OF METALS. This is a first course in physical metallurgy and involves a consideration of the correlation of the structure of metals and alloys to their physical properties together with the effects of mechanical work and heat. Lecture and recitation, three hours.

Prerequisites: Physics 3b; Chem. 21a; and Met. Eng. 29. (3) I, II (Crouse)

142 — HEAT TREATMENT. This course comprises a study of the methods used and the principles involved in the heat treatment of metals and alloys. Lecture and recitation, two hours; laboratory, one three-hour period.

Prerequisites: Met. Eng. 60 and 140. (3) I (Hammond)

143a — PHYSICS OF METALS. This course comprises a study of the laws governing the formation of alloys. Among the subjects discussed are the atomic structures of metals and alloys, atomic forces, super-lattices, perfect and imperfect crystals, corrosion, the physical properties of metals as a function of their periodic and electro-chemical position, diffusion, free energy, and Hume-Rothery and other rules. The course also entails the application in the X-ray laboratory of the work taken in the classroom with the development of an operating technique in radiography as applied to metals and alloys. Lecture and recitation, two hours; laboratory, three hours.

Prerequisites: Phys. 123b; Chem. 140b; and Met. Eng. 140. (3) I (Hammond)

143b — PHYSICS OF METALS. This is a continuation of 143a without the laboratory. Lecture and recitation, three hours.

Prerequisite: Met. Eng. 143a. (3) II (Hammond)

144 — FERROUS AND NON-FERROUS METALLOGRAPHY. This course comprises a study of the structure of metals and alloys by means of microscopic examination together with the reasons for observed structural changes. The techniques involved in the preparation of specimens for the microscope are also stressed. Lecture and recitation, one hour; laboratory, six hours.

Prerequisite: Met. Eng. 140. (3) II (Hammond)

164 — ELEMENTS OF LOW TEMPERATURE CARBONIZATION.

This course comprises a study of the principles involved in the low temperature treatment of coals and other carbonaceous materials, including hydrogenation. Lecture and recitation, three hours, with assigned reference reading.

Prerequisites: Phys. 123b; and Chem. 140b.

(3) I, II (Crouse)

166 — EXTRACTIVE METALLURGY. This course comprises a study of the principles and mechanics applied to the practice of ore beneficiation involved in the preparation of mine products for market, including discussion of the principles of plant design, with reference reading planned to keep the student informed of current technological developments. Lecture and recitation, five hours.

Prerequisites: Chem. 21a; Physics 3b;
and Met. Eng. 26 or 27.

(5) II (Carter)

167 — EXTRACTIVE METALLURGY PLANT PRACTICE. This course comprises the laboratory application of the principles studied in Met. Eng. 166. Laboratory, forty-four hours a week for two weeks in the summer between the Junior and the Senior years.

Prerequisite: Met. Eng. 166.

(2) S (Carter)

175a, b — SEMINAR. This course includes round table discussion of various metallurgical principles and problems, the preparation and delivery of papers and reports on metallurgical subjects, extemporaneous speaking, and the briefing of technical books and articles in the current literature. Two hours.

Prerequisite: six semesters in

(1) I, II (Staff)

Metallurgical Engineering.

205 — HEAT TREATMENT OF METALS AND ALLOYS. This is an advanced course in which the various factors involved in the heat treatment of metals and alloys are considered with special emphasis on the particular metal or alloy on which the student wishes to specialize. Reference reading and laboratory work are emphasized. Lecture and recitation, two hours; laboratory, eight hours.

(6) I, II (Crouse, Gerhard, Hammond)

207 — TECHNOLOGY OF ALLOYS. This course comprises a study of the principles and practices used in the production of alloys of various kinds with special stress upon any particular group of alloys that the student may choose. Reference reading and laboratory work are emphasized. Lecture and recitation, two hours; laboratory, eight hours.

(6) I, II (Cruse, Gerhard)

208 — ADVANCED METALLOGRAPHY. This course comprises a detailed study of the structure of metals and alloys together with their preparation for examination under the microscope. In addition instruction is given in the taking of microphotographs. Reference reading and laboratory work are emphasized. Lecture and recitation, two hours; laboratory, eight hours.

(6) I, II (Crouse, Hammond)

209 — ADVANCED ORE DRESSING. This course comprises a study of the technique of ore dressing plant design and gives an opportunity for original research in concentration problems. Lecture and recitation, two hours; laboratory, eight hours.

(6) I, II (Carter)

210 — TECHNOLOGY OF LOW TEMPERATURE CARBONIZATION. This course comprises a detailed study of the principles and practices employed in the low temperature carbonization of carbonaceous materials such as oil

shales, bituminous and cannel coals. Reference reading and laboratory work are emphasized. Lecture and recitation, two hours; laboratory, eight hours.
Prerequisite: sufficient background in Physics, Chemistry and Metallurgy. (This background to be determined by the Head of the Department after consultation with the student.) (6) I, II (Crouse)

213 — X-RAY METALLOGRAPHY. Radiography of castings and welds. The atomic structure of metals and alloys will be determined. Laue, Debye, focusing, rotating crystal, Phragmen and Sacks type diffraction cameras will be studied; also stereographic and gnomonic projection, pole figures, fibre patterns, crystal structure and Comen's analytical method of calculating lattice parameters. Radiographs will be made and interpreted. Lecture and recitation, two hours; laboratory, four hours. (4) I, II (Hammond)

214 — THE METALLIC STATE. Fibre patterns, stereographic projections, and goniometry. Crystal chemistry and metallic crystals. Quantum mechanical concepts for isolated atoms are applied to interacting atoms leading to methods of calculating energies and forces binding atoms together in crystals. Lecture and recitation, two hours. (2) I, II (Hammond)

215 — ALLOY STEELS. The thermal behavior of low and high alloy steels is discussed on the basis of each particular phase diagram. The subcritical transformation of austenite in alloy steels and the physical properties of the product of this type of decomposition of austenite are reviewed. Martensite and intermediate transformation are treated. The heat treatment of complex alloy steels such as the high speed and high alloy die steels receive particular emphasis as well as the heat resisting steels and the alloy cast irons. Lecture and recitation, two hours; laboratory, three hours. (3) I, II (Crouse, Gerhard)

216 — THE PHYSICAL CHEMISTRY OF STEEL MAKING. A study of the kinetics and equilibria involved in steel making processes. The reactions of the open hearth furnace are considered in terms of the free energies of substances at elevated temperatures and the activities of components in the metal, slag and gaseous phases. Special attention is given to slag constitution, slag control, and the effects of alloying and deoxidizing additions to the liquid metal. The influences of melting, refining and deoxidizing practices on the properties of the finished steel are also emphasized. The laboratory work consists largely of the production and testing of small experimental heats of both acid and basic electric furnace steels. Lecture and recitation, five hours; laboratory, three hours. (6) I, II (Crouse, Hammond)

217 — THE MICROSCOPY OF SLAGS AND REFRACTORIES. The identification and study of phases in slags and other non-opaque materials of metallurgy through microscopic examination and the use of X-ray diffraction methods. Emphasis is placed on the interpretation of microstructural features as indicators of high temperature reaction tendencies among silicate and oxide phases. Phase equilibrium relationships in silicate and oxide systems are also considered with some consideration being given to phase identification. Lecture and recitation, one hour; laboratory, six hours. (3) I, II (Hammond)

218 — DIFFUSION AND HEAT FLOW IN METALS. The differential equations of Fick and Fourier are applied to diffusion in the homogenization of alloys and in solid state transformations, to the heating of metals by furnace

and induction methods, and to the cooling of metals in heat treatment, welding and casting. Radiation and convection, in addition to conduction, are given consideration as modes of heat transfer involved in the principles of furnace design. Lecture and recitation, two hours. (2) I, II (Hammond, Gerhard)

230a-d — RESEARCH IN X-RAY METALLOGRAPHY. This course comprises research problems in X-ray metallography, both diffraction and radiographic, and allied subjects. Lecture and recitation, two hours; laboratory, eight hours. (6) I, II (Hammond)

240a-f — SPECIAL PROBLEMS IN METALLURGICAL ENGINEERING. Open to graduate students who have the ability to carry on research. Each course consists of individual work in one of the various fields of metallurgical engineering. Laboratory, six hours. (3) I, II (Staff)

250 — INDUSTRIAL MINERAL PREPARATIONS AND USES. This course comprises a study of the more common non-metallic substances utilized in industry such as carbon, lime, clay, nitrogen and so on. Lecture and recitation, three hours. (3) I, II (Beebe)

275a-d — SEMINAR. Review of current literature in the field of Metallurgical Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two hours. (1) (Staff)

MINING ENGINEERING

126 — ELEMENTS OF MINING. This course comprises a study of the origin of mineral deposits, prospecting, boring, explosives, drilling, blasting, support of mine workings, and related subjects. Lecture and recitation, five hours; with assigned reference reading and reports.

Prerequisites: Chem. 1b; Physics 3b; and Geology 12b. (5) I (Carter)

127a, b — MINING TECHNIQUES. This course comprises a study of open cut mining, placer mining, coal stripping, transportation and hoisting, shaft sinking, and other development operations, mechanical loading of coal underground, underground mining methods, mine surveying, accident prevention, and related techniques. 127a, lecture and recitation, five hours; 127b, lecture and recitation, three hours, laboratory, 3 hours.

(5, 4) I, II (Carter)

129 — MINE VENTILATION AND DRAINAGE. This course comprises a study of the principles involved in the conditioning of underground mine atmospheres, the drainage of underground mine workings, and the problems encountered in the handling of emergencies such as fires and floods in underground workings. Lecture and recitation, five hours.

Prerequisite: Min. Eng. 126.

(5) II (Carter)

130 — MINE ADMINISTRATION. This course comprises a study of the engineering aspects of mine administration and management, of the technology and mechanization studies of mining and market preparation processes, and practice in the fundamentals of mine plant design. Lecture and recitation, three hours, with assigned reference reading.

Prerequisite: Min. Eng. 126.

(3) I (Spokes)

131 – MINE SURVEYING. Given at summer surveying camp at Camp Robinson, Noble, Breathitt County, Kentucky. Field practice in mine surveying and mapping.
Concurrent: Civ. Eng. 15 and 16b. (1) (Staff)

175a, b – SEMINAR. This course includes general round table discussions of various mining principles and problems, the preparation and delivery of papers and reports on mining subjects, extemporaneous speaking, and the briefing of technical books and articles in the current literature. Two hours.
Prerequisite: six semesters in Mining Engineering. (1) I, II (Carter, Spokes)

203 – MINE ORGANIZATION. This course comprises a detailed study of the structure and function of a mining enterprise from both the financial and the engineering standpoints. Lecture and recitation, three hours.
(3) I, II (Carter)

206 – EXPLOSIVE ENGINEERING. This course comprises a study of the principles involved in the use of explosives in large scale mining and quarrying practice. Lecture and recitation, two hours. (2) I, II (Carter)

207 – ADVANCED PROSPECTING. This course comprises a detailed study of the principles involved in the geophysical investigation of the minerals of the earth's crust. Lecture and recitation, two hours. (2) I, II (Carter)

208 – COAL DUST INVESTIGATION. This course consists essentially of research in the design and utilization of a laboratory scale gallery for the investigation of the explosive qualities of native bituminous coals. Laboratory, twelve hours. (4) I, II (Carter)

209 – ADVANCED MINE ENGINEERING. This course comprises a detailed study of the procedure and methods used in collecting and recording data and engineering information involved in the systematic development and exploitation of a mining property. Lecture and recitation, three hours; drawing and mapping, eight hours. (7) I, II (Carter)

220a-f – SPECIAL PROBLEMS IN MINING ENGINEERING. Open to graduate students who have the ability to carry on research. Each course consists of individual work in one of the various fields of Mining Engineering. Laboratory, six hours. (3) I, II (Carter, Spokes)

221a-d – SEMINAR. Review of current literature in the field of Mining Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two hours.
(1) (Carter, Spokes)

VIII. FINE ARTS

ART

As prerequisite to graduate work in art, the Department requires that the student shall have had preliminary work in art equivalent to that required of its majors in art. In general this means the completion of an under-graduate sequence of six to eight full semester courses in drawing, design and painting balanced by four to six courses in the history of art, and a reading knowledge of either French or German. The graduate program in art provides for creative work in painting, design, etc., study and research in history and criticism of art, and also in the field of art education. Any of these may be emphasized. In every case a written thesis is required.

The department is housed in a modern building with special equipment. Studios for practical work are designed to meet professional standards. An art library adjoins the classrooms. There are extensive collections of photographs, color reproductions, and related art reference materials. An exhibition gallery provides for the study of original works of art. The Department itself has a working collection of paintings, prints and drawings.

116a, b — PRINTMAKING. Technical instruction in printmaking processes: lithography, etching, wood cut. Open to advanced students on consent of instructor. Six studio hours.
Prerequisites: Art 63 and 65a.

(2) I, II (Amyx)

138 — NORTHERN RENAISSANCE ART. The arts of the Renaissance and Reformation outside Italy from the late middle ages through the sixteenth century. Northern humanism; analyses of style; study of individual masters. Illustrated lectures and reports.

(2) I (Rannells, Johnston)

140 — ITALIAN RENAISSANCE ART. The arts of the Renaissance in Italy from the late middle ages through the sixteenth century. Italian humanism; analyses of style; study of individual masters. Illustrated lectures and reports.

(3) I (Rannells, Johnston)

141 — BAROQUE ART. The arts of the Reformation and Counter-Reformation in Europe from the mid-sixteenth century in Italy through the eighteenth century in France and Germany. The Baroque and Rococo styles; study of individual masters. Illustrated lectures and reports.

(3) II (Rannells, Johnston)

142 — MODERN ART. The arts in Europe and America from the mid-eighteenth century through the nineteenth century. Consideration of social and economic changes and technological developments in relation to art; style revivals; aesthetic theory; individual artists. Illustrated lectures and reports.

(3) I (Rannells, Johnston)

143 — CONTEMPORARY ART. The arts of the twentieth century in Europe and the Americas. Consideration of social and technological changes in relation to art. Examination of contemporary forms in architecture, sculpture, and painting; developments in photography, industrial design, city planning. Analyses of styles; study of individual artists. Illustrated lectures and reports.

(3) II (Amyx, Rannells)

147 — ART IN AMERICA. A survey of American architecture, sculpture, painting, illustration, handicrafts, industrial design, etc., from Colonial times to the present. American museums, exhibitions, sales; art schools; current art literature. Illustrated lectures and reports. (2) S (Rannells)

151 — CRITICISM OF ART. Analyses, interpretations, evaluations. Fundamentals of aesthetics and criticism in history, and in the contemporary arts. Discussions and reports. Open only to senior and graduate majors in Philosophy, Literature, Music and Art. (3) I (Amyx)

155 — ART IN ELEMENTARY SCHOOLS. An advanced course for in-service teachers in elementary schools. Presentation of art principles as essential content in the teaching of art; practice of art as a means to effective classroom teaching of art; planning of programs of instruction related to the developmental levels of vision and expression in the child; criticism and evaluation of classroom projects developed and put in operation as a part of the work required in the course. Lectures, conferences, studio work and reports. Given in collaboration with the College of Education. (2) II (Fitz)

157 — ART IN THE SECONDARY SCHOOL. Art for teachers in secondary schools. The literature of art education. Problems of definition and interpretation; evaluation of visual training; the relation of art to other subjects. Courses of study. Teaching materials: reproductions, supplies, books, etc. Lectures, conferences, and reports. (3) S (Rannells, Amyx)

160a, b — SEMINAR IN ART. Current problems in art; correlations of theory and practice; discussions and reports. For seniors and graduates majoring in art. Students with an average below B in art are advised to schedule additional work before entering this course. The Seminar is prerequisite to the comprehensive examination required for graduation. (1) I, II (Staff)

165a, b — INTERMEDIATE PAINTING. Advanced problems in space and color construction. Introduction to figure and portrait. Individual development of basic painting procedure. Nine studio hours. *Prerequisites: Art 63 and 65b.* (3) I, II, S (Amyx)

167 — PROFESSIONAL PAINTING TECHNIQUES. Advanced problems in painting media: oil and tempera. Preparation of grounds. Problems developed from historical and contemporary procedures in painting and closely related media. Open to advanced students on consent of instructor. Nine studio hours. *Prerequisite: Art 165b.* (3) I, II (Amyx)

175a-d — INDEPENDENT WORK: HISTORY, CRITICISM. Individual research and writing on local and contemporary art problems, history and criticism of art, and aesthetics. Studies in collaboration with other humanistic disciplines. Each semester's work is subject to review by the staff. Open only to advanced students upon approval of the department head. (3) I, II, S (Staff)

177a-d — INDEPENDENT WORK: PAINTING, PRINTMAKING. Individual research and experimental work in technical and theoretical problems of drawing and painting, printmaking, etc. Each semester's work is subject to review by the staff. Open only to advanced students upon approval of the department head. (3) I, II, S (Staff)

179a-d – INDEPENDENT WORK: DESIGN, CONSTRUCTION. Individual research and experimental work in technical and theoretical problems of interior design, design in decoration, industrial design, sculptural design, color and light problems, etc. Each semester's work is subject to review by the staff. Open only to advanced students upon approval of department head.

(3) I, II, S (Barnhart)

Note: The Independent Work courses provide for the student of special interests and abilities and enables him to supplement the work of regularly scheduled courses, including those in the field of art education.

MUSIC

The Department of Music requires, as prerequisite for the Master's degree with a major in music, the equivalent of that required for the A.B. degree in music at the University of Kentucky. If the transcript of the undergraduate record of a student from another university or college does not show that the student's program of work is substantially equivalent to that required for a bachelor's degree at the University of Kentucky, additional undergraduate work will be required before the student is admitted to full graduate status.

A reading knowledge of one modern foreign language is required of all candidates for the Master of Arts Degree. The language to be selected shall be either French or German, except in the case of a vocal major, when Italian is preferred.

Thesis

The candidate may choose as a subject for a thesis an approved research problem in the field of music education.

For those students whose primary interest is music education it is recommended that they work toward the Master of Arts in Education. See page 120.

102a, b – VOCAL PEDAGOGY. For teachers of voice, supervisors of school music, and choir directors. The study of physical and psychological problems in the teaching of voice production, the study of breath control, diction, resonance, interpretation, and repertoire. The student will observe three voice lessons a week at the direction of the instructor, to cover as many different vocal problems as possible, in addition to regular class meetings at which problems are studied.

(2) I, II, S (Kiviniemi, Houden)

103a, b – PIANO PEDAGOGY. A study of teaching methods and materials.

(1) I, II, S (Montgomery)

106a, b – PIANO LITERATURE. A survey of music written for the piano, emphasizing problems in performance of standard piano literature.

(2) I, II, S (Patch)

107a, b – VOCAL LITERATURE. A study of the development of the Art Song, Opera, Oratorio, and Cantata.

(2) I, II, S (Houden)

108a, b – HISTORY AND LITERATURE OF THE ORGAN. A course of study designed to give the organ student a practical knowledge of the development of the organ, its construction, the standard literature, and teaching materials.

(2) I, II, S (Blackburn)

110 – RESEARCH PROBLEMS IN PEDAGOGY OF THEORY. An independent course in the teaching of counterpoint and theory to be selected by the instructor on the basis of prerequisite training and practical need.

(2) (Kinney, Wright)*

111 – RESEARCH PROBLEMS IN MUSIC. A research course in some phase of music other than history or pedagogy of music theory. The student will confer with the instructor whenever either or both of them deem it advisable. (2) (Staff)*

112 – RESEARCH PROBLEMS IN MUSIC. Continuation of 111. This course permits research in some phase of music which may or may not lead to the master's degree. (2) (Staff)*

113a, b – COUNTERPOINT. A study of Counterpoint based on 16th Century and 18th Century contrapuntal techniques. Original compositions and analysis.

Prerequisites: Music 34a, b.

2) I, II, S (Kinney, Wright)

115a, b – CHORAL CONDUCTING. A study of the fundamentals of choral conducting and choral literature, emphasizing materials for the secondary school level. (2) I, II, S (Lewis)

116a, b – INSTRUMENTAL CONDUCTING. A study of the technique and practice of the fundamentals of instrumental conducting and score reading. (2) I, II, S

117a, b – ORCHESTRATION. This course includes a study of the individual instruments of the orchestra and band with practice in scoring for these instruments. (2) I, II, S

118 – MARCHING BAND TECHNIQUE. A study of Marching Band organization and formation planning, including practical instruction in the care and repair of instruments. (2) II, S

119a, b – COMPOSITION. A beginning course in original composition which affords the student opportunity to compose in the small forms. (2) I, II, S (Wright)

200a, b – PROBLEMS IN CREATIVE WORK IN HOMOPHONIC FORMS OF COMPOSITION. An independent course dealing with creative work, of the structure of the theme and variations, the rondo and the sonata-allegro. Analysis of works of the masters is supplemented by original compositions in the various forms.

Prerequisites: Music 13b and 34b.

(2) (Kinney, Wright)*

201a, b – PROBLEMS IN CREATIVE WORK IN CONTRAPUNTAL FORMS OF COMPOSITION. An independent course dealing with the structure of the chorale, motet, canon, invention and fugue. Analysis of works of the masters is supplemented by original compositions in these forms. *Prerequisites: Music 34b and 113b.* (2) (Kinney, Wright)*

203 – CHORAL LITERATURE AND TECHNIQUE. An opportunity to study the world's best choral literature and remedial work along the lines of choral presentation; interpretation as influenced by harmonic and melodic structure, vowel production, tone quality, tempi, traditions, program building, etc. (2) I, S (Lewis)

204 – ADVANCED BAND TECHNIQUE. An advanced course in band technique with concentration on band organization and materials, the tech-

* Offered according to demand.

nique of band conducting, and general preparation of band instrumentations for balance, the study of transposition of band repertoire, and an intensive study in the field of band arranging. (2) II, S (Prindl)

208a-c — SEMINAR IN MUSIC. One two-hour meeting is held each week for discussion of current developments in music found in recent books and periodicals. (1) I, II, S (Stein)

210 — BAROQUE MUSIC. An intensive study of the baroque period beginning with the close of the Renaissance and culminating with Handel and Bach. It considers the underlying religious, philosophic, social, and scientific influences of that era and their effect upon the forms and style of music. *Prerequisites: Music 19a, b or 20a, b.* (2) I, S (Stein)

211 — THE CLASSIC AND ROMANTIC PERIODS. An intensive study of keyboard compositions, chamber music, and early orchestra writing in Italy, France, and Germany; and the music of the romantic period in Germany and France. Lectures, conferences, and reports. *Prerequisites: Music 19a, b or 20a, b.* (2) II, S (Stein)

212 — MUSIC IN AMERICA. This course considers the history of music in America from Colonial times to the present day. Analysis of certain important works of contemporary native composers. Recitations, assigned readings, and research. *Prerequisites: Music 19a, b or 20a, b.* (2) (Stein)*

213 — INTERPRETATION OF INSTRUMENTAL LITERATURE. This course is intended for experienced leaders of school musical organizations, particularly of orchestras and bands. It includes a critical study of the standard classical chamber and symphonic scores and their interpretive problems based upon the composer, period, and style. Lectures, demonstrations, and assigned readings. *Prerequisites: Music 117a, b or permission of the instructor.* (2) (Prindl)*

214 — ADVANCED INSTRUMENTAL CONDUCTING. This course is intended to develop the ability to interpret and conduct the larger forms written for the symphony orchestra. It provides further opportunity for practice in reading from the full score and includes problems of phrasing, balance, tempo, timbre, and dynamics. Lectures and drill periods with the University Symphony Orchestra. *Prerequisites: Music 116a, b or with permission of the instructor.* (2) (Prindl)*

215a, b — PIANO. A study of advanced major piano works such as the sonatas and concertos of Mozart, Beethoven, Brahms, and other masters. Two half-hours of individual lessons a week. A term paper approved by the instructor, which gives evidence of research in some phase of piano literature, style, or composer; and at least one recital each semester. *Prerequisite: eight semester hours of accredited undergraduate study in applied music, piano.* (2) I, II, S (Montgomery, Patch)

216a, b — STRINGS. A study of the literature of the violin, viola, or violoncello, including the advanced etudes and caprices of Fiorillo, Rode, Dont, Campagnoli, Goltermann, and others; and the major sonatas and concertos of

* Offered according to demand.

Beethoven, Tschaikovsky, Brahms, etc. A term paper approved by the instructor which gives evidence of research in some phase of string literature, style, or composer; and at least one recital each semester.

Prerequisite: eight semester hours of (2) I, II, S (Wright, Kinney)
accredited undergraduate study on the
string instrument in which graduate work
is desired.

217a, b – VOICE. A study of the more advanced type of song literature covering the classic, romantic, and modern periods. A term paper approved by the instructor which gives evidence of research in some phase of solo vocal literature, style, or composer, and at least one recital each semester.

Prerequisite: eight semester hours of (2) I, II, S (Houden, Kiviniemi)
accredited undergraduate study in voice.

218a, b – ORGAN. A study of the major works of Bach, Mendelssohn, Franck, Widor, et cetera, and the modern compositions of American, French, German, and English schools. A term paper approved by the instructor, which gives evidence of research in some phase of organ literature, style, or composer, and at least one recital each semester.

Prerequisite: eight semester hours of accredited (2) I, II, S (Blackburn)
undergraduate study in organ.

231a, b – WOODWIND INSTRUMENTS.

Prerequisite: eight semester hours of accredited (2) I, II, S (Adams)
undergraduate study on the woodwind
instrument in which graduate work is desired.

232a, b – BRASS AND PERCUSSION INSTRUMENTS.

Prerequisite: eight semester hours of accredited (2) I, II, S (Prindl)
undergraduate study on the brass or percussion
instrument in which graduate work is desired.

MUSIC EDUCATION

Graduate Curriculum in Music Education

The following curriculum in Music Education is recommended for teachers of Public School Music leading toward the Master of Arts in Education:

Education 222, Methodology of Educational Research	3 semester hours
Education 225, Supervision of Instruction	4 semester hours
Education 251, Problems in Public School and Community Music	2 semester hours
Education 252, Field Problems in Music	2 semester hours
Education 253, Independent Work in Music Education	2 semester hours
Education 254, Problems in Educational Psychology	3 semester hours
Music 102a, b, Vocal Pedagogy	4 semester hours

Music 110, Research Problems in Pedagogy of Theory	2 semester hours
Music 111, Research Problems in Music	2 semester hours
Music 112, Research Problems in Music	2 semester hours
Music 115a, b, Choral Conducting	4 semester hours
Music 116a, b, Instrumental Conducting	4 semester hours
Music 117a, b, Orchestration	4 semester hours
Music 203, Choral Literature and Technique	2 semester hours
Music 204, Advanced Band Techniques	2 semester hours
Music 208a-c, Seminar in Music	3 semester hours
Music 210, Baroque Music	2 semester hours
Music 211, Classic and Romantic Periods	2 semester hours
Music 215a, b, Piano	each 2 semester hours*
Music 216a, b, Strings	each 2 semester hours*
Music 217a, b, Voice	each 2 semester hours*
Music 218a, b, Organ	each 2 semester hours*
Music 231a, b, Woodwind Instruments	each 2 semester hours*
Music 232a, b, Brass and Percussion Instruments	each 2 semester hours*

Advisers: Stein, Dickey.

There is no language requirement for the Master of Arts in Education.

A student, wishing to complete the degree requirements on a thirty hour basis without a thesis, must select courses at the "200 level" in the amount of 12 credits approved by the Dean of the College of Education and the Head of the Music Department.

Ed. 251 – PROBLEMS IN PUBLIC SCHOOL AND COMMUNITY MUSIC. This course, open only to advanced students, will consider problems in teaching, supervising, organizing, and leading public school and community activities. Students in service will have an opportunity to bring problems from their own school or community situation; and, when possible, the instructor will visit them in the field. Projects, demonstrations, reading, and discussion.
(2) (Lewis)

Ed. 252 – FIELD PROBLEMS. This course is designed to permit the teacher or leader in the field to work out his local problems as an independent graduate teaching project under the guidance of the music staff.
(2) (Lewis)†

Ed. 253 – INDEPENDENT WORK IN MUSIC EDUCATION. This course is designed for graduate students who undertake research problems in music education and is to be conducted in regular consultation with the instructor.
(2) (Lewis)†

* Not more than four credits will be allowed in graduate applied music.

† Offered according to demand.

IX. LAW

The following courses in the College of Law are accepted as graduate work when taken by students majoring in Political Science, Economics, Sociology, Commerce or other fields in which such courses are recommended by the major professors. No major programs of study are offered in Law at present leading to advanced degree.

101a, b – CONTRACTS I, II. Williston's Cases (4th edition). Formation, parties, consideration, formalities, contracts for the benefit of third persons, assignments, joint obligations, conditions – express and implied, performance, illegality, impossibility. (3) I, II (Murray)

102a, b – TORTS I, II. Thurston and Seavey's Cases. Intentional torts and defenses, negligence, causation, contributory negligence, care in the use or occupation of land, liabilities of vendors of chattels, extra-hazardous occupations, joint torts, deceit, defamation, privilege, malicious prosecution, interference with social and business relations, inducing breaches of duty. (3) I, II (McEwen, Oberst)

103 – PROPERTY I and II. Casner and Leach's Cases. Basic course in property: wild animals, possession, gifts, bona fide purchasers of personality and realty, estates in land, the Statute of Uses, controlling the use of land, easements, and rights incident to ownership of land. (4) I (Matthews)

105 – AGENCY. Mechem's Cases (3d edition). Nature of the relation, competency of parties, appointment, delegation of authority, liabilities of principal and of agent, ratification, undisclosed principal, termination; master and servant – vicarious liability. (2) II (Ham, Stahr)

107a – CRIMINAL LAW. Hall and Glueck's Cases. Jurisdiction; the criminal act, complete and incomplete; criminal intent, actual and constructive; duress and mistake of fact, of law; justification; parties in crime; crimes against the person; and crimes against property. (2) I (Moreland)

107b – CRIMINAL PROCEDURE. Mikell's Cases (3d edition); Orfield's Criminal Procedure from Arrest to Appeal. Arrest, preliminary examination, bail, jurisdiction and venue, methods of prosecution, the grand jury, indictment and information, arraignment and pleas, nolle prosequi and motion to quash, trial and verdict, motions after trial, judgment and sentence. (2) II (Moreland, Stahr)

121a, b – EQUITY I, II. Chafee and Simpson's Cases (2d edition). Basis of equity jurisdiction, specific performance of contracts, reformation, rescission and cancellation, injunctions in relation to torts, bills of peace, quia timet, interpleaders, accounts, position of equity in the legal system. (3) I, II (Moreland)

122 – PROPERTY III. Martin's Cases. Titles and Conveyancing: adverse possession, prescription, accretion, dedication, execution and delivery of deeds, boundaries, exception and reservation, easements by implication, covenants of title, estoppel, priorities. (3) I (Matthews, Murray)

123 — NEGOTIABLE INSTRUMENTS. Britton's Cases on Bills and Notes (3d edition). Formal requisites of negotiability, transfer, holder in due course, equities and defenses, liability of parties, discharge.

(3) II (Ham, Stahr)

141 — PARTNERSHIP. Gilmore's Cases (3d edition). Partnership distinguished from other forms of business associations; partnership by contract and by estoppel; ownership and transfer of property; powers and obligations of partners; rights and remedies of creditors; termination of partnership.

(1) S (Ham)

145 — INSURANCE. Patterson's Cases (2d edition). Insurable interest, the contract, concealment, representations and warranties, implied conditions, waiver and estoppel, construction of policy.

(2) II (Whiteside)

147 — RESTITUTION. Woodruff's Cases. Restitution at law for mistake, duress and undue influence, illegality, impossibility, benefits received under contracts within and without the Statute of Frauds, benefits received without contracts.

(2) S (Murray)

148 — DOMESTIC RELATIONS. Madden and Compton's Cases. Marriage and divorce, annulment, separation, alimony, property interests of husband and wife, mutual obligations of the spouses, parent and child.

(2) II (Stahr, Whiteside)

149 — MUNICIPAL CORPORATIONS. Fordham's Local Government Law. Incorporation and existence, legislative control, powers, liabilities, municipal officers, revenue, indebtedness.

(2) S (Stahr)

150 — PUBLIC UTILITIES. Robinson's Cases (2d edition). Nature of public service, public employment and profession, withdrawal, duty to public, refusing service, commencement of service, management, liability for default, termination of service, regulation of charges, discrimination.

(3) S (Moreland)

153 — TAXATION. Griswold's Case (2d edition). Problems in federal, estate, gift, income and excise taxes.

(3) I (Whiteside)

154 — DAMAGES. McCormick's Cases. Nature of damages, avoidable consequences, counsel fees, certainty, compensation, damages for non-pecuniary injuries, pain, inconvenience, mental suffering, aggravation value, interest, special rules in certain acts, damages for death, eminent domain.

(2) S (Oberst)

160a, b — PRIVATE CORPORATION I and II. Stevens and Larson's Cases. Characteristics, formation, powers and liabilities, rights of stockholders, directors, legislative control, dissolution, creditors.

(4) I (Ham)

161a, b — CONSTITUTIONAL LAW I and II. Dowling's Cases (3d edition). Amending constitutions, function of judiciary in enforcing constitutions, separation and delegation of powers of government, powers of Congress in regulation of interstate commerce and taxation, the 14th Amendment, due process and equal protection of the laws, powers of the President, citizenship and suffrage, and intergovernmental relations.

(4) I (Oberst)

162 — PROPERTY IV (Future Interests). Simes' Cases. Rights of entry, possibilities of reverter, reversions, remainders, executory limitations, limitations

to classes, freehold interest subject to a term, rule against perpetuities, illegal restraints and conditions. (3) II (Matthews)

163 – WILLS AND THE ADMINISTRATION OF ESTATES. Mechem and Atkinson's Cases (3d edition). Descent and distribution, the making and revocation of wills, including testamentary capacity, execution, attestation, integration, revocation by mistake and dependent relative revocation, probate and administration including will contests, contracts of personal representatives. (2) II (Whiteside)

164 – CONFLICT OF LAWS. Cheatham, Dowling and Goodrich's Cases (2d edition). Domicile, jurisdiction of courts, procedure, contracts, property, movable and immovable, family law, divorce, inheritance, foreign administration, foreign judgments. (3) II (Moreland, McEwen)

165 – TRUSTS. Scott's Cases (3d edition). Uses and Statute of Uses; trusts distinguished from other relationships; their creation; their elements; the transfer of the beneficiary's interest; the administration, termination and modification of trusts; charitable trusts; liability to third persons and of third persons; resulting and constructive trusts. (4) II (Matthews)

166 – SALES. Woodward's Cases (3d edition). Subject matter of sale, executory and executed sales, bills of lading, fraud, liens and their enforcement, stoppage *in transitu*, inspection, warranty and remedies for breach of warranty, Statute of Frauds. (3) I (Murray)

167 – ADMINISTRATIVE LAW. Stason's Cases (2d edition). Administrative bodies – functions and discretion, notice and hearing subpoenas, evidence, findings, orders, scope and method of judicial review. (3) II (Oberst)

174 – CREDIT TRANSACTIONS. Durfee's Cases on Security. Real estate loans, suretyship, pledges, mortgages, problems of agricultural finance. (3) S (Matthews, Oberst)

176 – TRADE REGULATION. Oppenheim's Cases. Trade marks and trade names; contracts not to compete at common law; competitive practices; intimidating and molesting; unfair practices; unfair advertising; combinations; the federal antitrust statutes. (3) II (Oberst)

178 – CREDITORS' RIGHTS. Hanna and MacLachlan's Cases (4th edition). Enforcement of judgments; fraudulent conveyances; general assignments; receivership; bankruptcy; assets, distribution. (3) II (Whiteside)

179 – LEGISLATION. Read and MacDonald's Cases. Typical federal and state statutes will be used. The history of legislation, legislative agencies, content, preparation, province and subject matter, legislative drafting, means of making laws effective, mechanics, interpretation, operation, amendment, abrogation and repeal, relation of traditional law to legislation. (2) II (Matthews)

180 – LABOR LAW. Selected materials. The right to organize, collective bargaining, labor controversies, strikes. Wage and hour laws; antitrust laws affecting labor. (2) II (Stahr)

183 – LANDLORD AND TENANT. Walsh and Niles' Cases. Characteristics of leases; recreation of the relationship of landlord and tenant; covenants implied in the lease; restrictions on the lessee's use of the property; transfers by the lessor and by the lessee; rent; taxes; repairs; and termination of the relationship. (2) S (Murray)

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