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BULLETIN

University of Kentucky



Graduate School

1948-49

July, 1948

RECEIVED

University of Kentucky



Graduate School
1948-49

UNIVERSITY CALENDAR

1948-1949

1948

FIRST SEMESTER

- September 16, 17 Thursday and Friday—Registration of former students according to an alphabetical schedule
- September 18 Saturday—Registration of new students
- September 20 Monday—Class work begins
- September 25 Saturday—Last date one may enter an organized class for the First Semester
- October 15, 16 Friday and Saturday—Period for filing application for degrees
- October 25 Monday—Last date one may drop a course without a grade
- November 25 Thursday—Thanksgiving holiday
- December 18 Saturday noon—Christmas holidays begin

1949

- January 3 Monday, 8:00 a. m.—Christmas holidays end
- January 22-27 Saturday through Thursday—Final examinations
- January 27 Thursday, 6:00 p. m.—First Semester ends

SECOND SEMESTER

- February 1, 2 Tuesday and Wednesday—Registration and classification for all students, according to an alphabetical schedule
- February 3 Thursday—Class work begins
- February 8 Tuesday—Last date one may enter an organized class for the Second Semester
- March 4, 5 Friday and Saturday—Period for filing application for degrees
- March 7 Monday—Last date one may drop a course without a grade
- April 14-19 Thursday, 8:00 a. m. to Tuesday, 8:00 a. m.—Easter holidays

May 29	Sunday—Baccalaureate Services
May 31—June 4	Tuesday through Saturday—Final examinations
June 3	Friday—Eighty-second Annual Commencement
June 4	Saturday, 6:00 p. m.—End of Second Semester
June 7-11	Tuesday through Saturday—4-H Club Week

SUMMER SESSION 1949

June 17-18	Friday and Saturday—Registration and classification for all students
June 20	Monday—Class work begins
June 23	Thursday—Last date one may enter an organized class for the Summer Session
July 1, 2	Friday and Saturday—Period for filing application for degrees
July 4	Monday—Independence Day holiday
August 12	Friday—Summer Session Commencement
August 13	Saturday noon—End of Summer Session
September 13	Tuesday—Opening of First Semester of 1949-50

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.	.....	Farm Economics
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
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.	.....	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
GRAHAM B. DIMMICK, Ph. D.	.....	Psychology
HAROLD HARDESTY DOWNING,		
B. C. E., M. S., Ph. D.	.....	Mathematics
W. CLEMENT EATON, Ph. D.	.....	History
STATIE ESTELLE ERIKSON, Ph. D.	.....	Home Economics
ALVIN E. EVANS, M. A., Ph. D., J. D.	.....	Law
EDWARD FRANKLIN FARQUHAR, M. A.	.....	English
ERNEST NEWTON FERGUS, Ph. D.	.....	Agronomy
WESLEY PATTERSON GARRIGUS,		
Ph. D.	.....	Animal Husbandry
LYMAN VERNON GINGER, M. A.	.....	Education
CARSIE HAMMONDS, M. S., Ph. 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
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
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.	Education
JASPER BERRY SHANNON, Ph. D.	Political Science
JONAH W. D. SKILES, M. A., Ph. D.	Ancient Languages
HUBERT SORENSON, M. A., Ph. D.	Education
DUDLEY EUGENE SOUTH, M. A., Ph. D.	Mathematics
OLUS JESSE STEWART, A. B., M. S., Ph. D.	Chemistry
RODMAN SULLIVAN, A. B., A. M., Ph. D.	Economics
WILLIAM SEPTIMUS TAYLOR, M. S., Ph. D.	Education
DANIEL VOIERS TERRELL, C. E.	Engineering
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
EDWARD WIEST, A. M., Ph. D.	Economics

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 catalog, 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 departments: Bacteriology, Chemistry, Education, Economics, English, History, Mathematics, Physics, Psychology, Political Science, Romance Languages, and in the combined fields of Agricultural Economics and Rural Sociology. Minor work may be carried in any department offering graduate courses.

ADMISSION TO GRADUATE STANDING

Graduates of institutions accredited by the University may be admitted to the Graduate School upon the presentation to the Registrar of a certificate of graduation and an official transcript of undergraduate courses taken. The status of the institution is to be ascertained from the Registrar of the University. Graduates from non-accredited institutions are encouraged to secure a bachelor's degree

from an accredited institution. In particular cases they may be admitted to the Graduate School on the basis of doing additional work before being admitted to full graduate status.

It should be clearly understood that admission to the Graduate School does not necessarily admit a student to full graduate status. A student attains full graduate status only when he has fulfilled all the preliminary requirements of the degree which he seeks and of the department under whose direction he is pursuing graduate work.

Department prerequisites are determined jointly by the Dean of the Graduate School and the respective departments. In brief, it may be stated that such prerequisites usually consist of the equivalent of an undergraduate major. In some fields, the equivalent of an undergraduate minor is sufficient.

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 at this institution.

REGISTRATION

Graduate students should register in the Graduate School on special cards prepared for this purpose.

Applicants from institutions other than this University are also required to file an official transcript showing (a) all undergraduate work covered, (b) graduate work taken, if any, and (c) degrees received.

If the record submitted to the Registrar entitles him to admission he should confer with the Dean of the Graduate School and his major professor concerning preliminary requirements that he may have to satisfy and as to the graduate courses that he should take.

Preliminary requirements may be added from time to time as found necessary and all such requirements, together with graduate courses, must be recorded in the Registrar's Office and must be satisfied by the student before he is eligible for the degree for which he is registered.

All courses listed in this bulletin, and all courses which may appear later in the regular University catalog, which have numbers above 100, may be counted as credit toward a graduate degree, provided that courses numbered 100 to 199 inclusive, may receive graduate credit only with the approval of the student's graduate committee. A grade of D in a course will not be given graduate credit or residence. No graduate credit is given for courses taken by correspondence or class extension.

FEEES

Registration fees per semester are the same as for undergraduate students in the college in which the major work is done, that is, \$57.00 for residents of Kentucky; \$87.00 for non-residents who regis-

tered before September 1, 1947; \$115.00 for those who registered after September 1, 1947.

Before an advanced degree, other than the doctorate, is conferred a fee of \$17.00 must be paid at the Comptroller's Office of the University. This covers the graduation fee, diploma fee, fee for binding thesis when the thesis is required and all other incidental fees. The fee for candidates for the doctorate is \$25.00.

APPLICATION FOR DEGREE

All candidates for degrees are required to make formal application for the degree at the office of the Registrar, on special cards provided for that purpose, at least four weeks prior to the date on which the degree is to be conferred.

REQUIREMENTS FOR ADVANCED DEGREES

A graduate student is expected to familiarize himself with the requirements for the degree for which he is a candidate and is held responsible for the fulfillment of these requirements. This applies to the last dates on which theses may be accepted, the dates for examinations, the proper form for theses and all other matters regarding requirements for degrees.

The University of Kentucky offers the degree of Doctor of Philosophy in the twelve departments listed on page 7 of this bulletin, the regular academic degrees of Master of Arts and Master of Science in all departments, and professional degrees in Public Health, Education, Engineering, Agriculture and Home Economics. The requirements for these various degrees are as follows:

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

CREDITS

The candidate shall complete twenty-four semester hours of graduate work in course with a standing of 2 and no grade below C shall be counted.

COURSES

The major field shall comprise, as to courses, two-thirds of the work and with electives (within the department or allied departments) of one-third of the work, except in the field of Education in which one-half of the work must be in the major subject. The two shall have graduate relationship. All of the work may be taken within one department if the student desires.

RESIDENCE

The minimum residence requirement is one academic year of 36 weeks. This residence requirement may be fulfilled by any combination of semesters or summer sessions which total 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 make a longer period necessary. Part-time work during a semester is evaluated on the basis of the amount of work carried, 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.

TRANSFER OF CREDITS

No transferred credits are accepted toward the Master of Arts or Master of Science degrees. All work for these degrees must be done at the University of Kentucky. However, a student is not asked to repeat a course which he has satisfactorily completed at another institution.

THESIS

A thesis is required of every candidate. Two typewritten copies of the completed thesis must be presented before the date set for the oral examination. One copy is presented to the Dean of the Graduate School to be bound and placed in the University Library and the other to the major professor to be retained by the department concerned.

The Graduate School issues a special bulletin giving definite instructions regarding the form in which the thesis must be presented, and stating the University regulations regarding the style of cover page, title page, biographical sketch, etc., which must be followed. Students are required to observe these instructions in submitting theses and dissertations.

LANGUAGE REQUIREMENT

A reading knowledge of at least one modern foreign language is required. This language should be pertinent to the program of the student. The language requirement must be satisfied by an examination given by the foreign language department offering instruction in the language concerned. The passing of this examination shall satisfy one of the two language requirements for the doctorate.

EXAMINATIONS

Examinations on regular class work are taken by all resident graduate students. A final *oral examination* is given the candidate not later than fifteen days before the close of the quarter. The Dean appoints an examining committee of at least three members for the purpose, selecting its members from the major and minor professors under whom work is done. The dean is *ex officio* a member of all such examining committees. The candidate is asked to defend his thesis and is examined on any subject matter related to his field.

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

The professional degrees of Master of Arts in Education and Master of Science in Education are open to students who have re-

ceived either the degree of B. A. or B. A. in Education, or the degree of B. S. or B. S. in Education.

Two plans are provided for satisfying the requirements for either of these degrees as follows:

1. Twenty-four semester hours in graduate courses exclusive of the thesis with an average standing of 2 or better, one academic year (36 weeks) in residence, and an acceptable thesis. No grade below C is counted toward an advanced degree.
2. At the option of the department (not of the student) the master's degree in education may be granted upon the completion of 36 semester hours in graduate courses with an average standing of 2 or better, 45 weeks in residence, and no requirement of a thesis.

There is no language requirement for either of the professional degrees in education. No student may satisfy more than one-half of the requirements for advanced degrees in the College of Education by part time work.

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 or better, 36 weeks in residence, and a thesis, or
2. The completion of 36 semester hours of graduate work with a standing of 2 or better, 45 weeks in residence, and no thesis requirement.
3. Under either plan no grade below C may be counted.
4. One-half of the work must be in one department, the remainder in any other department or departments approved by the major professor.
5. 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 or better.
2. No grade below C may be counted.
3. Thirty-six weeks in residence.
4. An acceptable thesis.
5. The passing of a final comprehensive examination.
6. 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 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 the 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.

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

FEES. Except for part time work the fees for a resident student who is a candidate for a master's degree in engineering are the same as for undergraduates. (See the regular University catalog.) The fees for a professional degree are \$15.00 for registration and \$17.00 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, passes the required examination in the subjects, presents a satisfactory dissertation, and is deemed worthy of 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 a scholarship should be shown by a thorough acquaintance with present knowledge in his special field of learning and a marked capacity for research.

REQUIREMENTS FOR APPLICANT

ADMISSION

Admission to the Graduate School and acceptance of advanced credits from other institutions must first be approved by the Registrar.

In order to be accepted as an *applicant* for the degree of Doctor of Philosophy the student must present evidence that he has completed an undergraduate course and has received his baccalaureate degree from a college of recognized standing.

The Graduate Committee reserves the right to decide in each case of applicancy for a degree whether the prerequisite training has been satisfactory and, if any of the years of advanced work have been passed in another institution, whether they may be properly regarded as having been spent under suitable guidance and favorable conditions. Private study is not considered as equivalent to univer-

sity work. In any case the student must pass the qualifying examinations at the University of Kentucky and spend the last year of the residence requirement at this 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 who will appoint a special committee for that student. This 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, passed the qualifying examinations, and has made formal application to be so enrolled.

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.

REQUIREMENTS FOR CANDIDATES

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. Neither time spent in study, however long, nor the accumulation of facts, however great in amount, nor the completion of advanced courses, however numerous, can be substituted for independent thinking and original research.

Work done in other institutions of learning may be accepted toward the doctorate at the University of Kentucky but no work is credited which has not been done in a college or university of recognized standing or in a research laboratory.

LANGUAGE REQUIREMENTS

The applicant must give evidence of having a good reading knowledge 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 and these examinations must be taken at the University of Kentucky. Ordinarily French and German are expected to be offered, but other languages may be substituted on recommendation of the special committee if it is considered that such languages are of greater importance in the special field of work. The language requirements must be satisfied before the applicant can be admitted to the qualifying examination.

QUALIFYING EXAMINATION

Applicants for the degree of Doctor of Philosophy are required to pass a Qualifying Examination. This examination should be taken during the second semester of the second year of residence. The examination shall be both oral and written and shall cover both major and minor subjects. It shall be prepared and given to the applicant by a committee of five to be appointed by the Dean of the Graduate School. The language requirements must have been met before the qualifying examination is taken. No applicant is eligible for 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. If the applicant passes the qualifying examination he is then considered as a *candidate* for the degree and may make formal application for this rating.

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 dissertation and an abstract 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 four weeks before the final examination.

PRINTING OF DISSERTATION

One hundred printed copies of the dissertation must be presented to the University within one year from the time when 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 sightly 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 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. The award is paid in ten equal monthly installments and does not include a remission of tuition or other University fees. The appointments are made for one year only but may be renewed if it can be shown that the prosecution of research should continue.

These fellowships and scholarships are open to students who hold a bachelor's degree from any college or university in good standing, provided the student has shown some special aptitude for the line of work he desires to pursue. No student should apply for the award 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 A DEGREE

Graduate students who are not candidates for an advanced degree are not required to designate major or minor subjects, but may elect their work with a view to the special purpose 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 upon the same conditions that are imposed upon those who are 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.

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 (See Biological Sciences)
- 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
- Bacteriology
- Botany
- Entomology (See Agriculture)
- Horticulture (See Agriculture)
- Hygiene
- Psychology
- Zoology

IV. PHYSICAL SCIENCES

Chemistry
Engineering (See Engineering)
Geography
Geology
Mathematics and Astronomy
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

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

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 for their first semester of residence at the University 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) and permission of the instructor.

(3) I, II, S (Skiles)

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

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

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

Prerequisite: A. L. 18 or consent 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 consent 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 consent of instructor. (3) II (Skiles)

120—GREEK CIVILIZATION. Topics in the political, social, economic, and cultural life of ancient Greece, with special reference to its 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 LITERATURE IN ENGLISH TRANSLATION. The Epic. *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. (2) I (Skiles)

122b—CLASSICAL LITERATURE IN ENGLISH TRANSLATION: The Drama. 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 a 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. (2) II (Skiles)

151a-e—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 linguistics, etc.

Prerequisite: Consent 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 consent of instructor. (3) I, II, S (Skiles)

RELATED COURSES IN OTHER DEPARTMENTS

Anthropology 106. Ethnology of Europe.

Anthropology 110a. Methods in Anthropology.

Art. 35. Ancient Art.

Art. 36. Medieval Art.

Education 154. Student Teaching in Languages.

Education 219. History of Educational Thought.

English 108a. Principles of Literary Criticism.

English 130a. Comparative Literature.

German Language and Literature 150. Origin and Development of the German Language.

History 28. The Ancient World.

Journalism 21. Etymology.

Philosophy 101a. History of Philosophy. (Ancient and Medieval).

- Philosophy 118. Plato.
Philosophy 119. Aristotle.
Political Science 171a. Early Political Theory.
Psychology 217. Psychology of Language.
Romance Languages and Literatures 204a, b.
Romance Philology.
Sociology 105. Social Theory: Plato to Comte.

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 sixteen semester hours of English must be offered, including seminar. A maximum of eight semester hours in other subjects is permitted, 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.

The Department will accept candidates for the Doctor's degree in the fields of later American Literature, Eighteenth Century and Linguistics.

102—HISTORY OF THE ENGLISH LANGUAGE. A survey of the development of the language, based upon Emerson's *History of the English Language*; other readings upon various phases of language development.

(3) I

105—CHAUCER. The principal works of Chaucer will be read. Each student will prepare one lead.

(3) II

106a—ENGLISH ROMANTIC POETRY. A rapid survey of the characteristics of the classical period, and a more careful study of growing signs of Romanticism in the early part of the eighteenth century. The French Revolution and its influence on the chief poets of the Romantic Movement. Special emphasis on Wordsworth, Byron, Shelley, Keats and other prominent poets of the first quarter of the nineteenth century.

(3) I (Ward)

106b—ENGLISH ROMANTIC PROSE. This course is designed to continue the study of ideas developed in English 106a as revealed in Rousseau, Godwin, Coleridge, Hazlitt, Lamb, DeQuincey, the Gothic romance, and Scott.

(3) II (Ward)

107a—VICTORIAN POETS. 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 careful study of Carlyle, Ruskin, Newman, Spenser, Arnold, Huxley, and related writers of the period in the field of prose. Assigned parallel readings, class discussion, and lecture.

(3) II (Brady)

108a—PRINCIPLES OF LITERARY CRITICISM. The course attempts to show criticism as a growth and development in a historical survey and to give a corpus of opinion about literature.

(3) I (Farquhar)

108b—PRINCIPLES OF LITERARY CRITICISM. A continuation of 108a.

(3) II (Farquhar)

109—PRE-SHAKESPEAREAN DRAMA. A historical course in English dramatic origins.

(3) I (Farquhar)

110a—SHAKESPEARE—COMEDY. Shakespeare's comedies will be studied in detail.

(3) I (Farquhar)

110b—SHAKESPEARE—TRAGEDY. A continuation of 110a, which is not prerequisite, although desirable.

(3) II (Farquhar)

111a—THE EIGHTEENTH CENTURY NOVEL. A study of the novel from its beginnings in English Literature to the advent of Scott.

(3) I, S (Cooke)

111b—THE VICTORIAN NOVEL IN ENGLAND. A study of the Victorian novel to and including Thomas Hardy.

(3) II, S (Knight)

116—THE CONTEMPORARY DRAMA. Development and tendencies in Continental, British, and American dramatic literature, 1850 to 1918.

(3) I (Farquhar)

123a—AMERICAN LITERATURE BEFORE 1830. A survey intended to show the development of American life, thought, and letters up to the Transcendental movement. Emphasis upon Edwards, Paine, Franklin, Irving, Cooper, Bryant.

(3) I (Knight)

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) II (Knight)

124—THE RENAISSANCE. A survey of the literature of the Elizabethan period exclusive of the drama. Foreign sources of the English Renaissance. The sonnet from its origin to its development in Spenser. The pastoral from Theocritus to Spenser. Utopian literature from Plato to More.

(3) I

125—PRONUNCIATION OF MODERN ENGLISH. A study of present day pronunciation; dialectical peculiarities. Students will become proficient in using a phonetic alphabet.

(3) II

127a,b—LITERATURE OF THE BIBLE. A literary study of the Bible by Books. It develops an appreciation of literature generally because of the demand that literature identify itself with the highest thought and feeling.

(3) I, II (Farquhar)

130a,b—COMPARATIVE LITERATURE. Extensive reading of literary masterpieces through the ages from Homer to the present day. A study of the great traditions of civilization as reflected in the literary monuments. Lectures, assigned readings, and class discussion. Intended for advanced undergraduates or graduate students. The reading is assigned entirely in translations, but a reading knowledge of at least one foreign language is highly desirable.

(3) I, II (Brady)

131a-d—INDEPENDENT WORK. A course for juniors and seniors of exceptional scholastic standing. Each student pursues a course independently. He writes a paper embodying results of this study and submits to an examination by the staff of the Department.

(2) I, II, S (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. Especial attention is given to the social and economic conditions which motivated this literature.

(3) II (Knight)

143—EDGAR ALLAN POE. A comprehensive study of Poe's works, poetry and prose. Primarily for the summer session.

(3) S (Farquhar)

147—AGE OF JOHNSON. From the death of Poe to 1798. Johnson and his circle: Burke, Goldsmith, Gray, Walpole, Cowper. The pre-romantic movement.

(3) I (Cooke)

152—AGE OF POPE. Addison and Steele, Swift, Pope, and Defoe.

(3) II (Cooke)

153—RESTORATION AND THE DRAMA OF THE EIGHTEENTH CENTURY.

(3) I

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

(3) I, II (Farquhar)

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 on establishing mood, reactions between characters, suspense, three voice modulations, pause, and other modes of emphasis, sustaining tone and emotion, projecting voice and characterization, procuring audience response, timing, and analysis of characterization. This course is designed to be helpful to public speakers, actors, teachers, and to those who wish to overcome self-consciousness and awkwardness and to develop grace of movement, and coordination of mind and body.

(3) I (Fowler)

161—THEORY AND TECHNIQUE OF THEATRE DIRECTING. Practice in directing, theory of plotting and interpreting a play for directors. Study of movement, interpretation of lines, creation of atmosphere, use of stage areas, arrangement of furniture for actors, picturization, balance, use of levels, methods of achieving a climax, handling of groups, planning of mob scenes. Attention to the psychology of actors, and audience reaction. Each student will have opportunities to direct plays under supervision. This course is designed for future workers in all types of theatres, especially for teachers who will have to direct plays as part of their regular work

(3) II (Fowler)

162—THEORY AND TECHNIQUE OF THEATRE PRODUCING.

Intensive study of the practical problems of play production. Application of modern aesthetic principles and theories to the theatre. Practice and demonstration of non-professional theatre producing. Attention to coordination of the playwright, designer, technical director, electrician, stage manager, and the actor; editing scripts, casting, rehearsal methods, directing techniques, the performance, dramatic criticism, management of "front of the house" including advertising, publicity, business management.

(3) III (Fowler)

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 manuscripts.

(3) I, II, S (Sterrett)

172—WRITING THE ONE-ACT PLAY. A course in the composition of original one-act play, stressing the uses of native materials, the traditions and present-life of the region with which the student is familiar. Attention on construction, technique, and dramatic composition of the well-made one-act play. Two acceptable one-act plays will be required of each student and students will have the opportunity to see the best play in the class produced by an acting group on the Guignol stage.

(3) I (Fowler)

174—WRITING THE FULL-LENGTH PLAY. A study of dramatic composition, construction, writing techniques as applied to the long play and the experimental play. Attention on writing for the educational theatre, the professional theatre, the moving pictures, and living newspaper. Production of the best plays in the class will be given on the Guignol stage. Only those students who have done outstanding work in the one-act writing course will be invited to enter this course. New students are accepted on the basis of original work submitted prior to registration.

(3) II (Fowler)

The following courses will be offered as may be requested by students pursuing studies leading to advanced degrees.

201a—LITERARY CRITICISM. The course is mainly an application of the philosophic and historical elements of literary criticism to some period of literature or to the works of some author in a period. It is criticism that essays the unity of all literature, its everlasting growth and the importance of inductive observation of literary phenomena.

(3) I (Farquhar)

201b—LITERARY CRITICISM. A continuation of 201a. Special problems assigned to students.

(3) II (Farquhar)

202a—STUDIES IN CONTEMPORARY DRAMA. This course is an application of the philosophy and history of drama to the modern drama as a whole and to the work of some particular dramatists. It includes a particular study of the work of Ibsen as prerequisite to any other study.

(3) I (Farquhar)

202b—STUDIES IN CONTEMPORARY DRAMA. A continuation of 202a. Special problems assigned to students.

(3) II (Farquhar)

206a, b—SEMINAR LITERATURE OF THE ENGLISH ROMANTIC PERIOD. Special studies in Literary critical theory; studies in principal writers and in currents of the Age of Wordsworth.

(3) II (Ward)

210—SEMINAR. BIBLIOGRAPHICAL STUDIES. Required of all candidates for the M. A. degree.

(3) I (Brady)

212a-d—SEMINAR. STUDIES IN PHILOLOGY. Studies in Old English poetry and prose—Cynewulf, Beowulf; Alfred and his circle; Middle English—Chaucer.

(3)

213a-d—SEMINAR. STUDIES IN EIGHTEENTH CENTURY LITERATURE. Johnson and his circle, Swift, the Romantic Revolt, or the foreign relations of English literature in the eighteenth century or the theory and practice of Neo-Classicism will be chosen for extensive investigation according to the needs of the students in the group.

(3) (Cooke)

214a-d—SEMINAR. VICTORIAN LITERATURE. Intensive studies in the social and literary significance of Arnold, Browning, Carlyle, and Ruskin.

(3) (Brady)

215a-d—SEMINAR. CULTURAL STUDIES. 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) (Farquhar)

216a-d—SEMINAR. THE CRITICAL PERIOD IN AMERICAN LITERATURE: 1890-1900. A study of the literature of the nineties, with emphasis upon the battle over realism, the loss of early national optimism, the resistance to naturalism, and the development of a genuine American literature. Special attention is given to the aesthetic and social problems found in the works of Garland, Henry James, Howells, and Stephen Crane; lesser writers and the magazines of the period are also investigated. One long research paper and one or more short ones are required.

(3) (Knight)

217a-d—SEMINAR. STUDIES IN CONTEMPORARY AMERICAN LITERATURE. A seminar in American literature from 1914 to the present. A preliminary survey of the trends of contemporary American literature is followed by research based upon the work of one writer or one school of writers of the 1930's. One long paper and one or more short ones are required.

(3) (Knight)

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 the Department.

(3) I, II, S (Staff)

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

Prerequisite: 106a or permission of the Department.

(3) I, II, S (Staff)

PROSEMINARS IN THE 18th, 19th, AND 20th CENTURY GERMAN LITERATURE. A balanced selection of works from one repre-

sentative 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:

(Staff)

6 semesters of German.

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 (Hagaman)

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, (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 (Staff)

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 (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 the 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 (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 (Hagaman)

JOURNALISM

Note.—Prerequisites for journalism majors for the following courses include Journalism 2, 21, and 22.

100a—NEWS REPORTING. Instruction and practice in news gathering, news evaluation, and news writing.

Prerequisite: Journalism 22.

(3) I, II, S (McCauley and Wild)

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

Prerequisite: Journalism 100a.

(3) I, II, S (McCauley and Wild)

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, S (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) I (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: Senior standing. (3) I (Moore)

107—EDITORIAL WRITING. A study of editorials, editorial columns, and editorial pages. Publication of copy encouraged.
Prerequisite: Journalism 22. (2) I (McCauley)

108—HISTORY OF JOURNALISM. A study of the rise and development of American journalism and newspapers.
Prerequisite: Senior standing. (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 (Portmann and McMillian)

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) II, S (Plummer and Moore)

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 (Wild and 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: Senior or graduate standing.

(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: Senior standing or consent of instructor.

(3) I, II (Plummer)

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; freelance article writing.

Prerequisite: Senior or graduate standing or consent of instructor. (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 senior standing. (3) II, S (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 of the College of Arts and Sciences. This Department is accredited by the Southern Association of Colleges and Secondary Schools and by the American Library Association.

Professional courses on the graduate level 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 degree of M. A. or M. S. in Edu-

cation may elect courses in library science to fulfill the Southern Association requirements for teacher-librarians. Students in subject fields also may elect certain courses in library science to qualify them for positions in special libraries. Those interested should consult with the Department for guidance in the selection of such courses.

PROFESSIONAL COURSES

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

Prerequisites: L. S. 121, 129a, (1 ea.) I, II, S (Staff)
133a, 145 and 152a.

110—THE LIBRARY IN THE SCHOOL. A study of the school library as a functioning organization. Topics included: School library objectives, planning and equipment, personal problems, standards, budgets and finance, circulation records and procedures, attendance and other records, instruction in the use of the library, school library activities, library relations with faculty, students and administration, the school library and other community agencies.

(3) I, S (Wofford)

112—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.

(3) I, S (Deily)

114—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 educational institutions, the library staff, finances, book collections, buildings, equipment, 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.

(3) II (Deily)

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 ad-

ministration. This course is open to prospective majors during their Junior year to give them an opportunity to test their interest in library science.

(3) I, S (Martin)

127—READING FOR YOUNG PEOPLE. This course will consider reading needs and interests of young people, together with library materials appropriate for each. Methods of reading guidance with various types of readers and employing all kinds of media will be considered. Important for the prospective school librarian and others planning library work with young people.

Prerequisites: L. S. 152a, 152b.

(2) II, S (Wofford)

128—CHILDREN'S LITERATURE. A survey of children's books with a comparative study of representative types from pre-school to junior high school age, illustrations and editions, book reviewing periodicals, aids in the selection of children's books and magazines. Closely correlated with L. S. 132.

(2) I (Martin)

129a,b—CATALOGING AND CLASSIFICATION. A study of the principles and methods of classifying and cataloging books. Emphasis will be on the functions of cataloging and classification but with sufficient practice work to enable students to handle cataloging problems in a library situation.

(3) I, II, (Wofford)

132—LIBRARY WORK WITH CHILDREN. A study of the origin and present status of library work with children in school and public libraries. Units of the course include story-telling and other methods of developing the child's appreciation of literature, administration of library work with children, and elementary school library service.

Prerequisite: L. S. 128.

(2) II, S (Martin)

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 (Deily)

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 (Deily)

139—FIELD WORK. Comparable to practice teaching. Observation of service in libraries in the area, and supervised practical work in all departments of the libraries of the University School and nearby school systems. The course is supplemented by classroom discussions. Six hours per week.

Prerequisites: L. S. 121, 129a,

(2) II, S (Wofford)

129b, 133a, 145, 152a and 152b.

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 the other processes concerned with the physical maintenance of the collection. The use of library statistics in making reports is investigated.

(2) I, S (Wofford)

152a—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)

152b—BOOK SELECTION. A continuation of L.S. 152a, with intensive reading and evaluation of books in biography, fiction, poetry, drama and essays. Practice in the selection of books for varying types of library situations, in oral and written reviews, characteristics of adult readers and their needs.

(2) II (Martin)

154—SEMINAR IN PROBLEMS OF LIBRARIANSHIP. The investigation and discussion of recent developments in librarianship as reported in the current literature, the use of the library survey as an instrument of analysis is explored, the influences of current economic, social, and educational problems upon library development.

Prerequisites: L. S. 121, 129a, 129b, 133a,

(3) II, S (Martin)

145, 152a, and 152b.

RADIO ARTS

This department has a two-fold function in (a) training students who wish to go into broadcasting as a profession, and (b) providing courses in certain phases of broadcasting for students in agriculture, home economics, education, journalism, political

science, commerce, social work, and other fields where such knowledge would prove useful.

Radio Arts classes are held in the Radio Studios section of the top floor of McVey Hall. Professional facilities utilized in the laboratory work of this department, include three studios, two announcing booths, three studio control rooms, a motor control room, a transmitter room, library and staff room, record room, sound effects room, and the usual office facilities. Two FM transmitters, operating on the upper and lower bands respectively, plus daily broadcasts scheduled over commercial stations, provide students with ample performance facilities.

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) (Robinson)

105—RADIO SCRIPT WRITING. One recitation and two hours laboratory per week. Practice in script writing in the various forms including music, variety programs, audience participation, talks, commercials. Original writing and adaptations. Analysis and evaluation of the various forms; study of audience program reactions.

(2) (Robinson)

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 105 and 106a.

(2) (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 or Niess)

110a—FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. A study of the literature of this period except for Moliere, Corneille and Racine.

(3) I, II, S (Horsfield)

110b—FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. The plays of Moliere, Corneille and Racine.

(3) I, II, S (Horsfield)

113a, b—ADVANCED FRENCH GRAMMAR. A study of the grammar and syntax of the French language. Also an introduction to French etymology.

(4) I, II, S (Ryland or Niess)

114a-b—INDEPENDENT WORK IN ROMANCE LANGUAGES. Independent work designed to meet individual needs of students after 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 (Schick)

116a, b—FRENCH LITERATURE OF THE TWENTIETH CENTURY. A study of recent writers. Lectures and selected readings.

(3) I, II, S (Niess)

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 (Niess)

108a, b—SPANISH AMERICAN LITERATURE. A study of the representative literature of the South American and Central 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.

(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 (See Biological Sciences.)

COMMERCE (See Economics and Commerce.)

COMMERCIAL EDUCATION (See Education.)

ECONOMICS AND COMMERCE

DEPARTMENTAL REQUIREMENTS FOR THE MASTER'S 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 the 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, and Farm Econ. 202a and b, 203.

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

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

Private finance: Economics 105, 209 and 211, Commerce 117, 129, 131.

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

Industrial relations: Economics 102, 130, Commerce 155, Law 142, and Psychology 106.

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

Accounting: Commerce 106a and b, 108, 113, 118, 129, 132a and b, 133 and 159.

Industrial management: Commerce 118, 137, 145, 155, and Psychology 106.

Marketing: Commerce 119, 135, 136, 140, 149, Economics 127, 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. The final examination ordinarily will be confined to the candidate's thesis subject and its relation to his general course of study.

DESCRIPTION OF COURSES

ECONOMICS

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

Prerequisite: Course 1.

(3) I (Carter)

103—TRANSPORTATION. Railways, waterways, highways, airways. Rates, service, management, regulation.

Prerequisite: Course 1.

(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: Course 1.

(3) I (Martin)

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: Course 1.

(3) I, II (Carpenter)

107—STATISTICAL METHOD—Introduction to the sources of business data, the use of calculating machinery, tabulation, simple charts and graphs, the averages, 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: Course 1 and an

elementary course in statistics.

(3) II (Carpenter)

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

Prerequisite: Course 1.

(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.

Prerequisite: Course 1.

(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: Course 2 or
consent 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: Course 1.

(3) II (Carter)

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: Course 1.

(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: Course 1.

(3) II (Carter)

134—ADVANCED ECONOMIC 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: Course 3 or consent 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: Course 2 or consent 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.

(2) II (Sullivan)

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 original 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 (Wiest and others)

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: Course 1.

(3) I (Wiest)

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

(3) II (Wiest)

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 and consent of instructor.

(2) I (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)

COMMERCE

101—SECRETARIAL OFFICE PRACTICE. This course is designed to provide laboratory and office experience for senior secretarial students. A minimum of 48 hours of office experience under supervision is required.

Prerequisites: Courses 14a and 14b.

(1) I, II (Thomas)

106a—INTERMEDIATE ACCOUNTING. Principles of financial statement, arrangement and content. Corporation accounting. Accounting for consignment and installment sales.

Prerequisites: Courses 7a and 7b.

(3) I (Haun and Beals)

106b—INTERMEDIATE ACCOUNTING. Accounting for partnerships, ventures, agencies and branches. Accounting features of

insolvent concerns and of consolidations and mergers. Estate accounting.

Prerequisites: Courses 7a and 7b (3) II (Haun and Beals)

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: Course 106b. (2) I (Beals)

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)

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: Courses 7a and 7b (3) II (Haun and 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 1, 7a, 7b. (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.

Prerequisites: Courses 7a, 7b. (3) II (Haun and 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.

Prerequisites: Courses 1, 10. (3) II (McIntyre and DeVoe)

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

Prerequisite: Course 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.

Prerequisites: Courses 105 and 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: Courses 106a and 106b. (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.

Prerequisites: Courses 106a, 106b. (3) II (Haun and Beals)

135—ADVANCED MARKETING. The literature and problems in the retail distribution of consumers' goods; wholesale distribution of consumers' goods; industrial goods; sales organization; sales promotion and advertising and price policies.

Prerequisite: Course 10. (3) II (DeVoe)

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

Prerequisite: Course 11 or the consent of the instructor. (3) I (McIntyre)

137—PROBLEMS IN 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 seniors of the College of Commerce, and to graduate students who have had the necessary prerequisite training. (3) I, II (Carter)

140—ADVERTISING CAMPAIGNS. The procedure necessary for developing an advertising campaign; a study of successful advertising campaigns as used by leading business houses throughout the country; and the planning and execution of an advertising campaign in conjunction with some local business house. The advertising campaign worked out by the student will be checked and tested for its effectiveness.

Prerequisite: Course 20, or the consent of the instructor. (2) I (McIntyre)

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

Prerequisite: Course 1. (3) I (Pickett)

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

Prerequisite: Course 1.

(3) II (Pickett)

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

(3) II

149—MARKET 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: Com. 10 and a course in statistics.

(3) II (DeVoe)

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 statistics.

(2) II (Connor and Massie)

151—SECRETARIAL STATISTICS. The rules of accuracy in computation, tabulation of data, graphing of business data, organization charts, statistical maps, the operation of calculators and other machines used in statistical work, the sources of statistical material of interest to business.

Prerequisites: Com. 17a, Secretarial

Practice, Typewriting

(3) I, II (Connor and Massie)

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; the problem of real estate securities as investments; governmental activities.

Prerequisite: Course 117.

(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; the public service.

(3) II (Carter)

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) II

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.

Prerequisites: Course 7a and 7b.

(2) II (Beals)

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.

A creditable thesis is required in all cases, giving evidence of ability to investigate a specific topic, with a critical bibliography. The examination will include courses, thesis, and general knowledge of related material.

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 made formal application to be so enrolled.

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 com-

prehensive examination, and generally supervise the writing of his dissertation.

The candidate must present one division in each of the four major fields of history. He must select two divisions from his field of concentration.

FIELD I, EUROPEAN HISTORY

1. The Ancient World
2. The Middle Ages
3. Modern Europe

FIELD II, ENGLISH HISTORY

1. British History through the Restoration
2. British History since the Restoration

FIELD III, AMERICAN HISTORY

1. Colonial America
2. The Confederation and Middle Period to 1830
3. Ante Bellum America to 1860
4. The Civil War and Reconstruction
5. American History since 1876

FIELD IV, THE FAR AND NEAR EAST, AND LATIN AMERICA

1. The Far East
2. The Near East
3. Latin America

FIELD V, MINOR FIELDS

The extent and content of his work in his minor department will be determined by the candidate's advisory committee.

The following courses are offered by the Department:

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: Course 5a or equivalent. (3) I (Vandenbosch)

105—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

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. (3) (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 and 5b or equivalents.* (3) I (Clark)

151b—THE AMERICAN FRONTIER. A continuation of Course 151a. It will consider the Trans-Mississippi West. *Prerequisites as for 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 Course 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 Mediaeval 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: Hist. 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 (Gillam)

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, b, c, d—SEMINAR IN THE FRENCH REVOLUTION

(3) (McCloy)

HISTORY OF EDUCATION (See Education.)

MARKETS AND RURAL FINANCE (See Agriculture.)

LAW (See Law.)

PHILOSOPHY

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

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

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) (De Boer)

120—GREAT RELIGIONS. A descriptive survey of several religions as they developed within their culture, for example: Confucianism, Shintoism, Hinduism, Buddhism, Judaism, Christianity. (3) (De Boer)

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) (De Boer)

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)

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)

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-101b. 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 (Edelmann or Trimble)

155b—COMPARATIVE GOVERNMENT — TOTALITARIAN STATES. A study of the totalitarian states of Europe and Asia.

(3) II, S (Edelmann or Trimble)

168—THE GOVERNMENTS AND POLITICS OF EASTERN ASIA. An introductory study of the political institutions of China, Japan, the Philippines, and Dutch East Indies, and India. Constitu-

tional 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-131b. English Constitutional History

Law 149. Municipal Corporations

Law 161a-161b. 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 (Edelmann)

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 (Edelmann or Vandenbosch)

Related Courses in other Departments

Economics 127. International Economic Policies.

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

History 120. Europe in the Twentieth Century.

History 135a-135b. The British Empire.

History 145. Russia Since 1900.

History 176. France Since 1870.

History 177. Germany Since 1870.

History 190a-190b. The Far East.

Law 164. Conflict of Laws.

Courses open only to Graduate Students

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 would 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—SEMNIAR 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)

SOCIAL WORK

The graduate curriculum is offered to students interested in social work as a profession and leads to a certificate. Prerequisites: Graduate standing, the equivalent of an undergraduate major and the consent of the department. Students lacking the prerequisite number of hours in the social sciences will be required to carry additional courses to make up the deficiency in this field. Application should be made to the department in advance of registration.

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)

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)

127a, b—TUTORIAL WORK IN SOCIAL WORK. Open only to senior majors in the department and to graduate students by permission.

(1 each) 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 the 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. For senior majors by special permission.

(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.

Prerequisite: 140a or consent of the 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.

Prerequisite: SW 140a, and consent of the 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: SW 122.

(3) II (Wetzel)

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: SW 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 graduate program in sociology combines the offerings of the Department of Sociology and the Department of Rural Sociology. This means that a candidate for the master's degree in sociology may utilize the experience of staff members in both departments, not only with respect to formal courses but also in thesis preparation and special problem courses.

101—POVERTY AND DEPENDENCY. A study of poverty and social dependence and of measures for their alleviation and re-

duction, 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 (Sanders)

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 (Hatch)

114a-b—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 (Hatch)

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 (Hatch)

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 (Anderson)

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 (Hatch)

Courses Open Only to Graduate Students

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) (Sanders)

220—SOCIAL ATTITUDES. (Same as Rural Sociology 220). The nature and genesis of rural attitudes and their relation to rural social control. (3) II (Kaufman)

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 (Anderson)

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 (Kaufman)

125—RURAL MOVEMENTS AND SOCIAL POLICY.

(3) I

160—RURAL COMMUNITY ANALYSIS.

(3) I, II (Kaufman)

180—ADVANCED RURAL SOCIOLOGY.

(3) I, S

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 (Kaufman)

230—RURAL URBAN RELATIONS.

(3) I

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, six hours a week.

Prerequisite: A & P. 10

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

or the equivalent.

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, six hours a week.

Prerequisites: A. & P. 10

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

or the equivalent;

Chemistry 1a and 1b.

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, one hour; laboratory, six hours a week.

Prerequisite: Junior standing.

(4) I, S (Allen and Wiedeman)

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, four hours a week.

Prerequisites: A. & P. 10

(3) I, S (Allen and Archdeacon)

or the equivalent;

Zoology 7b; Chemistry

1a and 1b; and the

consent of the 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, one hour; laboratory, six hours a week.

Prerequisites: A. & P. 10
or the equivalent.

(4) II (Allen)

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 the equivalent; *Physics;*
General Chemistry.

(3) II, S (Archdeacon)

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 the equivalent; *Physics;*
Organic Chemistry.

(3) I, S (Archdeacon)

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 the equivalent;
Chemistry 130a and 130b
or the equivalent; *Physical*
Chemistry desirable; Physics one year.

(3 ea.) I, II, S (Allen and Archdeacon)

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.

Prerequisites: A. & P. 10

(2) I, II (Archdeacon)

or the equivalent.

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.

Prerequisites: 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 PATHOLOGY (See Agriculture.)

ANTHROPOLOGY

101—PRINCIPLES OF ANTHROPOLOGY. Fundamental principles of anthropology; relationships of physical anthropology, anthropometry, ethnology, ethnography and archaeology; anthropology of the New World; North American prehistory; ancient human occupation in the Mississippi Valley; outline of man's prehistoric past in Kentucky; anthropological studies of Kentucky materials.

(3) I

103a-d—INDEPENDENT WORK IN ANTHROPOLOGY AND ARCHAEOLOGY (Given every year).

(3) (Staff)

105—ETHNOLOGY OF ASIA AND AFRICA. A study of the present races of mankind. The origins, migrations and present distribution of these races and their subdivisions. Three recitations per week.

(3) II

106—ETHNOLOGY OF EUROPE. A study of the origins and migrations of the ethnological groups of Europe. Three recitations per week.

(3) I

107—ETHNOLOGY OF THE NEW WORLD. A study of the origins and migrations of the ethnological groups of the new world. Three recitations per week.

(3) II

108—THE DEVELOPMENT OF CULTURE. A study of the origin of human culture and of the history of human cultural be-

havior. The course will contain a study of the origin and development of primitive behavior along cultural lines. It will not be presented as a series of studies of static culture but rather to show the flow of culture from basic human beginnings to present day civilization. (3) II (Haag)

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)

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) I (Haag)

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.

Prerequisite: Anthropology 1 or four hours
in any other biological science.

(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)

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)

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.

Prerequisite: Bacteriology 102 or 52; or 2b and Chemistry 1b. (4) I, S (Scherago, Humphries, and Edwards)

104—APPLIED BACTERIOLOGY. A course in bacteriological analysis to supplement Courses 52 and 102. Laboratory, four hours a week.

Prerequisites: Preceded or accompanied by Bacteriology 102 or 52; or 2b and Chemistry 1b. (2) I, II, S (Hotchkiss 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: Preceded or accompanied by 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: Preceded or accompanied by 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; Zoology 7b, 101b, and 106; Bacteriology 103, and consent of head of department. (4) I, S (Maxwell, Scherago, and Hotchkiss)

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 and b; consent of head of department. (4, 6) I, II, S (Maxwell, 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, S (Scherago, Humphries, and Edwards)

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 officers or those with equivalent training. (3) I, S (Scherago 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 or 52 or 102; Chemistry 21b. (4) II, S (Weaver and Humphries)

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 52, or 102; Chemistry 21b.

(4) II, S (Weaver and Humphries)

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

(2) I, S (Hotchkiss)

Prerequisites: Chemistry 130b; reading knowledge of one foreign language; preceded or accompanied by Bacteriology 125.

220—HISTORY OF BACTERIOLOGY. Conferences, two hours a week.

(2) I, S (Scherago and Weaver)

Prerequisite: Bacteriology 125.

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.

Prerequisite: Bacteriology 125; Chemistry 130c.

(4) II, S (Scherago and 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; Chemistry 130b.

(3) II, S (Weaver and 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 (4) I, S (Humphries or Muedeking)
130b and a reading knowledge
of German or French; Physical
Chemistry recommended.

226b—METABOLISM OF MICROORGANISMS. Continuation of 226a. Lectures or conferences, two hours; laboratory, four hours per week.

Prerequisite: Bacteriology 226a. (4) II, S (Humphries
or Muedeking)

235—IMMUNOCHEMISTRY AND ADVANCED IMMUNOLOGY. The chemistry of antigens and of antibodies and of the reaction between them in vitro and in vivo; immune and hypersensitive cellular reactions. Lectures and conferences, two hours; laboratory, four hours per week.

Prerequisites: Bacteriology 125b;
Chemistry 130b and 143b.

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 c; (3) I, S (Edwards)
Consent of instructor.

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. The principles which underlie the movement of materials in plants, covering absorption, translocation, and transpiration. Lecture, one hour; laboratory, four hours.

Prerequisite: 6 semester hours of Botany. (3) I

103b—PLANT PHYSIOLOGY. A continuation of 103a; the chemical processes and organic materials occurring within the plant. Lecture, one hour; laboratory, four hours.

Prerequisite: Botany 103a.

(3) 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 undergraduate 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.

Prerequisites: Botany 1b or its equivalent.

(4) I (McFarland)

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

Prerequisite: 125a.

(4) II (McFarland)

130—INTRODUCTION TO CYTOGENETICS. 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, 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) II (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.

Prerequisites: 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 their 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 its 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.

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—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: 125b or equivalent. (4) (McFarland)

207b—RESEARCH IN MYCOLOGY. A continuation of 207a.

Prerequisite: Botany 207a. (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 (Chambers and Heinz)

100b—PUBLIC HEALTH. A continuation of 100a. Environmental and organization approach to disease prevention.

(3) II, S (Chambers and Heinz)

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)

PSYCHOLOGY

The Department of Psychology has been accredited by the American Psychological Association as having adequate facilities for training students for the degree of Doctor of Philosophy with emphasis on clinical psychology. In cooperation with the Veterans Administration, the Department has set up a program of training in clinical psychology of four years duration leading to the doctorate. The students who are being trained in this program are appointed as part-time psychological interns at the local Veterans Administration Hospital, which is used as a training facility. The training program is described in Circular 105 of the Veterans Administration. Applications for internships were received by the Department in the spring of 1946 and 1947, and the students appointed began work in September of those years.

At present the American Psychological Association is emphasizing the importance of training facilities in clinical psychology in which students may acquire practical experience through contact with actual cases of psychoses, psychoneuroses, mental deficiency, behavior problems, and maladjustments in children and adults. Students not in training under the Veterans Administration may obtain practical experience at the Child Guidance Service, Eastern State Hospital, Kentucky Houses of Reform, the University Personnel Office, the University School, the Kentucky Training Home at Frankfort, and the State Reformatory at LaGrange. In 1948 the Department received a grant from the U. S. Public Health Service for improvement of its instruction in clinical psychology, particularly for students who are not employed by the Veterans Administration.

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 students who wish to do research on problems of student personnel.

The Department offers the degree of Ph.D. in experimental psychology. The laboratory is especially equipped for work on problems of sensation, perception, emotions, and learning.

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.

Apparatus, test equipment, and library facilities are suitable for advanced work in the courses which are listed below. It is assumed that graduate students entering the Department have had fundamental training in general psychology and in the biological and social sciences.

101—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, S (Skiff)

102—PRACTICE IN TESTING: PERSONALITY TESTS. The purpose of this course is to give the student practical training and experience in the use of a selected list of personality tests and closely related techniques, commonly used in evaluating the non-intellectual aspects of personality. Four hours a week.

Prerequisite: Psychology 8 or equivalent (2) II (Skiff)

103—PRACTICE IN TESTING: APTITUDE AND TRADE TESTS. This course provides laboratory practice in the use, scoring, and interpretation of individual tests used in the fields of vocational and educational guidance and selection. Six hours a week.

Prerequisite: Psychology 8 or equivalent (3) II (Mellenbruch)

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 (White)

105—EMPLOYMENT PSYCHOLOGY. Emphasis is placed on the characteristics of an effective interview, the significance of cer-

tain 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 morale, 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 (Calvin)

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. Some opportunity for clinical observation is provided.
Prerequisite: Psychology 1 (3) II (Ratliff)

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.
Prerequisites: Psychology 1 (3) I (Newbury)

116—ANIMAL BEHAVIOR. Three hours of lecture, two hours of laboratory a week. 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 subhuman species. Relationships to human problems are indicated.

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.

(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 two 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 (Croft)

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 (Ratliff)

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, Pre-School, and Elementary School.

Prerequisite: Psychology 7

(3) II (Humphreys)

126—MENTAL HYGIENE OBSERVATION. A continuation of Psychology 124. Students are given the opportunity to apply to concrete cases the principles and concepts developed in 124.

Prerequisite: Psychology 124 or Hygiene 120a. This course is offered also as Hygiene 120b, but cannot be carried in both departments.

(3) II (Ratliff)

201a—SEMINAR IN PSYCHOLOGY. One two-hour discussion each week of some current systematic concepts and research under way by graduate students and members of the staff.

(1) I, II (Pattie)

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

(1) I, II (Pattie)

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. Research or thesis work may be registered under this number. 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 their 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)

213—THE OBSERVATION PROCESS. An advanced course in sensation and perception, with special emphasis on: historical development of the problems of sensation and perception; experimental findings and techniques of investigating vision and hearing; theories of sensation and perception. Two hours lecture, two hours laboratory.

Prerequisite: Psychology 110 or equivalent.

(3) I (Calvin)

214—THEORIES OF LEARNING. An examination of theories which attempt 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. Lecture, two hours; laboratory, two hours.

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 its equivalent.

(3) II (Mellenbruch)

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)

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 Psychology 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)

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 affective 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

(2) II, S (Dimmick)

240—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 contra-indications. 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) non-directive psychotherapy (interview), (2) directive psychotherapy (interview), (3) play therapy, and (4) 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.

Prerequisite: A master's degree in psychology or equivalent training, and the consent of the 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

(3) II (Dimmick)

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) narcohypnosis or druganalytic 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)

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.

(2) I, II, S (Dimmick)

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.

Prerequisites: Zoology 1a, 1b. (3) I, S (Brauer and Muller)

101b—HISTOLOGY. Histology of the organs. A continuation of Course 101a in which the studies are based on the organs and special attention given to pathology.

Prerequisite: Zoology 101a. (3) II, S (Brauer and Muller)

102—ORNITHOLOGY. A study of the life histories, anatomy, and physiology of birds with particular reference to the habits, songs, nests, migration, and economic importance of our native birds.

(3) II, S (Allen)

103a—GENERAL ENTOMOLOGY. A beginning course in the study of insects. Gross anatomy, morphology, and life-histories of representatives of the most important orders.

(3) I (Allen)

103b—GENERAL ENTOMOLOGY. A continuation of Course 103a. Taxonomy and entomotaxy are given special attention during the second semester.

(3) II (Allen)

105—PARASITOLOGY. Designed especially for pre-medical, medical technology, pre-veterinarian and agricultural students. Protozoan, helminth, and arthropod parasites of man and domestic animals with particular emphasis on life histories, epidemiology, methods of control, methods for the diagnosis of parasitic diseases of both man and other vertebrate hosts, techniques for the examination of hosts for their parasites and the preparation of parasites for critical study.

Prerequisites: Zoology 1a, 1b, 101a (7a desirable).

(3) I, S (Edney)

106—EMBRYOLOGY. A general course in ontogeny. Studies in maturation, fertilization, cleavage, organogenesis and anomalies of development with laboratory work based on the chick and the pig.

Prerequisites: Zoology 1a, 1b, 101a.

(4) III, S (Brauer and Muller)

108a—PRINCIPLES OF ZOOLOGY. (Evolution) An advanced lecture course open only to juniors, seniors, and graduate students

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 Course 108a. The second semester is devoted to the study of heredity, eugenics, and animal instincts. Three times a week.
(2) II, S (Muller)

109—ANIMAL ECOLOGY AND FIELD BIOLOGY. A general course in ecology with special reference to the zoological aspects of the subject.
(3) (Allen)

110a-f—INDEPENDENT WORK. Special problems for individual students who are capable of pursuing independent investigations. For Zoology Majors.
(3) I, II, S (Staff)

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, etc.
Prerequisites: Zoology 1a, 1b.
(3) 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. Juniors majoring in Zoology are advised, and Seniors required to attend in order to receive tutorial instruction preparatory to the final comprehensive examination. For students majoring in biological subjects.
(1) I, II (Staff)

115a—ADVANCED PARASITOLOGY. (Protozoology) The etiology, pathology, epidemiology, diagnosis, prophylaxis and control of protozoan diseases of man. Practical studies in diagnosis.
Prerequisites: Zoology 1a, 1b; 105.
(3) II, S (Edney)

115b—ADVANCED PARASITOLOGY. (Helminthology) The etiology, pathology, epidemiology, diagnosis, prophylaxis, and control of cestode, trematode, and roundworm diseases of man. The analysis of life cycles and the diagnosis of helminth parasites of man. Three lectures, two laboratory periods.
Prerequisites as in preceding.
(3) II, S (Edney)

115c—ADVANCED PARASITOLOGY. (Medical Entomology) A study of Arthropods important in the causation and transmission of disease. Structure, life histories, methods of recognition and control. Collection, identification, and experimental approach to life cycles.
Prerequisites as in 115a.
(3) II (Neel)

130—ADVANCED LIMNOLOGY. Detailed analysis of fresh water environments with special emphasis upon biological productivity. Two hours lecture; four hours field and laboratory.

Prerequisites: Zoology 1a, 1b.

(4) I (Neel)

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

Prerequisites: Zoology 1a, 1b.

(4) I (Allen)

157b—VERTEBRATE ANATOMY. (1) Systematic consideration of classes, orders, and some families of Vertebrata. (2) Detailed dissection of types not previously studied. (3) Comparative organology and (briefly) physiology of the several classes. (4) Preparation of charts and diagrams of nervous systems, urinogenital systems, and vascular systems. (5) Complete demonstration of the mammalian anatomy.

(4) I, II, S (Allen)

166—PHYSIOLOGY OF DEVELOPMENT. A review of the theories of differentiation and a consideration of the genetic environmental, and correlative physiological factors in differentiation. Lectures, assigned readings and literature reports.

Prerequisites: 1a, 1b; 7a, 7b or 106.

(2) I (Brauer)

168—BIOLOGY OF SEX. The cytological, genetic, and physiological problems of sexual differentiation. Such cases as hermaphroditism, gynandromorphism, intersexuality, and reversals are considered. Lectures, literature reports, assigned readings.

Prerequisites: 1a, 1b; 7a 7b or 106.

(2) II (Brauer)

210a-c—PROBLEMS IN ZOOLOGY. Students qualified to undertake graduate work will be assigned to appropriate research problems to be pursued independently. Conferences, laboratory, field, and library work. Six hours per week. Written reports.

(3) I, II, S (Staff)

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 (2) I, II, S (Leader)
and organic chemistry.

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 (Leader)

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
(Offered 1949-50 and alternate years thereafter.)

115ab—NUCLEAR CHEMISTRY. The chemistry of the radioelements and other substances involved in nuclear reactions. Lecture, two hours.

Prerequisite: Chemistry 140b. (2) I, II
(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 (Watters)

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 (Watters)

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

Prerequisite: Chemistry 21b. (3) I (Watters)

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

(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

(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) (Watters)

(Offered 1949-50 and alternate years thereafter.)

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

Prerequisite: Chemistry 21b. (3) (Stewart, Watters)

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,
Mathematics 20b, and Physics 3b.*

(3) I, II, S (Dawson)

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; 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;
Physics 1c.*

(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: Junior or Senior standing. (1) I (Stewart)

188a—SEMINAR. Reports and discussions on recent research and current chemical literature. Required of all seniors. 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) I (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

(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 (Watters)

(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 Chemistry 140b. (2) I

(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

(Offered 1948-49 and alternate years thereafter.)

232—STEREISOMERISM OF CARBON COMPOUNDS. Optical isomerism of compounds containing asymmetric carbon atoms; polarimetry; optical isomerism of compounds containing no individ-

ual asymmetric atoms; stereochemistry or biphenyls and related compounds; cis-trans isomerism; and stereochemistry of the sugars. Lectures, three hours. (Offered each year.)

Prerequisite: Chemistry 130b.

(3) II

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 (Barkenbus)

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 (Dawson)

(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

(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)

(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)

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 location, physical features, climate, and soils on the production of raw materials and food.

Prerequisites: One geography course or permission of the instructor. (2) I, S (Hutter)

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.

Prerequisites: One geography course or permission of the 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.

Prerequisites: One geography course or permission of the 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 national basis. Population problems, economic adjustments, and political significance of resources will also be studied.

Prerequisites: One geography course or permission of the instructor. (2) I (Tuthill)

104—REGIONAL GEOGRAPHY OF ASIA. A study of the countries of the Orient and their geographic foundations. Major emphasis is given to the problems and development of India, China, and Japan and to an evaluation of their resources. The role of the Orient in the international landscape will also be studied.

Prerequisites: 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. Special reference to the strategic nature of their location will be made.

Prerequisite: One course in geography or permission of the instructor. (2) II (Parmenter)

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 the instructor. (2) II (Parmenter)

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.

Prerequisites: Geography 10 or permission of the 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 selected 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 by 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:

(3) I (Tuthill)

Geography 102.

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.

Prerequisites: Geology 30a, b; and General

Zoology or background in Zoology.

(3) I (McFarlan)

101b—PALEONTOLOGY. The study of geological faunas and the determination of their age. One lecture, three laboratory periods a week.

Prerequisite: Geology 101a.

(3) II (McFarlan)

105a-f—INDEPENDENT WORK IN GEOLOGY. Directed work in independent investigations. Thesis required.

(4 each)

106a—ECONOMIC GEOLOGY. Non-metallic mineral deposits. A study of the distribution, mode of occurrence, origin, methods of search for, and uses of deposits of economic importance. Two lectures, one laboratory conference per week.

Prerequisites: Geology 30a, b; Geol. 123a, b.

(3) I (Brown)

106b—ECONOMIC GEOLOGY. Metallic mineral deposits. Same as above but dealing with metalliferous deposits. The economics of various metal industries and methods of treatment of ores will be

briefly considered. Three lectures, one laboratory conference per week.

Prerequisites: Geology 30a, b; Geol. 123a, b. (3) II (Nelson)

106c—ECONOMIC GEOLOGY. Engineering aspects and groundwater. Professional training in the work of the geologic consultant and staff geologist in engineering work. Exploratory work for industrial and farm groundwater supplies.

Prerequisites: Geology 30a, b, and 123a, b. (3) (Hamilton)

107a-i—ADVANCED FIELD GEOLOGY. A field course in geologic mapping involving problems of local structure and stratigraphy. Six hours a week in the field.

Prerequisites: Geol. 10a, b. (3) I, II (McFarlan)

118a-d—FIELD WORK IN REGIONAL GEOLOGY. Eight weeks in the field in Colorado and Virginia in alternate years. Required for major students at the end of their junior year.

Prerequisites: Geology 30a, b. (8) S (McFarlan and Nelson)

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. No prerequisite.

(3) (McFarlan)

120b—GEOLOGY OF KENTUCKY. The mineral resources of the state, their distribution, origin, and uses. Fossil record.

No prerequisite. (3) (McFarlan)

122—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 principal producing fields. Three lectures and one laboratory period per week.

Prerequisites: Geology 30a, b,

General Elementary Physics.

(3) (MacQuown)

123a—MINERALOGY. A study of geometrical crystallography and other physical properties useful in mineral identification. One lecture and four hours laboratory per week.

Prerequisites: Geol. 30a, b; and

Chem. 1a, b, or a background in Chemistry.

(3) I (Nelson)

123b—MINERALOGY. The determination of minerals by physical properties, blowpipe analysis, and the petrographic micro-

scope. Includes a study of the origin, occurrence, and associations of these minerals. One lecture, 4 hours laboratory per week.

Prerequisite: Geol. 123a.

(3) II (Nelson)

124a, b, c—REGIONAL GEOLOGY. A study of the geological regions of the United States.

Prerequisites: Geol. 30a, b.

(3) I, II, S

125—METHODS OF SUBSURFACE CORRELATION. Methods of, and practice in subsurface stratigraphic work in petroleum geology.

Prerequisites: Geol. 122, 123a, b.

(3) II (Freeman)

126a, b—SEMINAR.

(1)

208—STRUCTURAL GEOLOGY. A study of the structural features of the earth's crust with an analysis of the mechanics involved in the production of such structures. Three lectures and recitations or 2 lectures and one laboratory per week.

Prerequisites: Physics 1a, b; Geol. 30a, b;

Geol. 124a, b.

(3) (Nelson)

210a—STRATIGRAPHIC PALEONTOLOGY. The succession of Paleozoic faunas and their use for stratigraphic correlations. One lecture, two laboratory periods per week.

Prerequisites: Geol. 30a, b;

Geol. 101a, b.

(3) I (McFarlan)

210b—STRATIGRAPHIC PALEONTOLOGY. A combination of 210a dealing with Mesozoic and Cenozoic faunas. One lecture, two laboratory periods 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 and 2 laboratory periods per week.

Prerequisites: Geol. 123a, b;

Physics 1a, b.

(3) (Nelson)

212b—SEDIMENTARY PETROLOGY. A study of sedimentary rocks based on microscopical analysis. One lecture and 2 laboratory periods per week.

Prerequisite: Geol. 212a.

(2)

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 and 2 laboratory periods per week.

Prerequisite: Geol. 212a.

(3) (Brown)

217a-f—SEMINAR.

(1) I, II, S

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.

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) (Downing)

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)

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: Consent of instructor.

(3) (Pence)

110a-f—INDEPENDENT WORK IN MATHEMATICS. Reading courses for upper division and graduate students of high standing.

Prerequisite: Consent of the Department.

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

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) (Downing)

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: Consent of the instructor.

(3) (Rohde)

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: Consent of instructor.

(3) I (Pence)

125a, b—INTRODUCTION TO HIGHER ANALYSIS. Development of the number system, elementary point set theory, limits, sequences, series, continuous functions, derivatives and integrals, elementary functions, Fourier series.

Prerequisite: Math. and Ast. 20b.

(3) (Pulliam)

126a, b—INTRODUCTION TO HIGHER ALGEBRA. Integral domains, fields, polynomials, groups, vector spaces, matrices, and determinants.

Prerequisite: Math. and Ast. 26.

(3)

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.

(3) (Pence)

or its equivalent.

128a, b—INTRODUCTION TO APPLIED MATHEMATICS. Numerical, graphical, and mechanical methods of calculation, approximation, theory of errors in numerical computation, algebra and calculus of vectors, calculus of variations.

Prerequisite: Math. and Ast. 25.

(3) (Pulliam)

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)

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)

203a-d—THESIS. A thesis is required, in addition to other requirements, for advanced degrees. Credit may be obtained while doing research for the thesis.

(3 each) (Senior Staff)

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: Consent of instructor.

(3) I (Pulliam)

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
consent of instructor.*

(3)

207—THEORY OF NUMBERS. Peano axioms, operations with integers and laws of operation, primes, greatest common multiple, unique factorization theorem, indicator, congruences, residue classes,

theorems of Euler and Fermat, primitive roots, quadratic residues, Diophantine equations.

Prerequisite: Math. and Ast. 126a, b, or (3)
consent of instructor.

208a, b—FUNCTIONS OF A REAL VARIABLE. Transfinite numbers, point set topology, continuous functions, methods of summation, Hilbert spaces, theories of integrals and derivatives, Fourier series, transcendental functions.

Prerequisite: Math. and Ast. 225a, b, or (3)
consent of instructor.

209a, b—FUNCTIONS OF A COMPLEX VARIABLE. Analytic functions, contour integration, residues, power series, analytic continuation, Riemann surfaces, maximum modulus theorem, conformal mapping, Riemann mapping theorem, simple functions, normal families, integral functions, transcendental functions.

Prerequisite: Math. and Ast. 225a, b, or (3)
consent of instructor.

210—ADVANCED MATHEMATICAL STATISTICS. Theory of sampling, the Chi-square distribution, testing statistical hypotheses.

Prerequisite: Math. and Ast. 120. (3) (South)

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: Consent of instructor. (3)

222—ORTHOGONAL SYSTEMS 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: Consent 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: Consent of instructor. (3)

225a, b—HIGHER ANALYSIS. Development of the complex number system from the Peano axioms, point set theory, limits, series, continuous functions, analytic functions, elementary functions, measure, Lebesgue, Riemann and Stieltjes integrals.

Prerequisite: Math. and Ast. 125a, b. (3)

226a, b—HIGHER ALGEBRA. Groups, rings, fields, extension fields, Galois theory, linear algebras, hypercomplex numbers, ideals,

Prerequisite: Math. and Ast. 126a, b, or
consent of instructor. (3)

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.

Prerequisite: 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.

Prerequisite: Math. and Ast. 125a, b, or
consent of instructor. (3) (Pulliam)

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)

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)

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. This course covers the fundamental laws of mechanics and the conditions under which they

hold. The work is usually based on some standard text. The student is expected to solve a representative list of problems. Lectures and recitations, four hours.

Prerequisites: Physics 3b; Mathematics 20b. (4) (Crawley)

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; Mathematics 20b. (3) (Hanau)

110—SPECTROSCOPY. A lecture 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 spectrographs, photographic and other recording methods, photometry, and the interpretation of spectra in the fields of atomic structure and spectrographic analysis.

Prerequisites: Physics 3b; Mathematics 20b. (3) (Hanau)

111—ELECTRICITY AND MAGNETISM. A study of 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; Mathematics 20b. (3) (Crawley)

114—VACUUM TUBES AND CIRCUIT THEORY. The course covers the theory of vacuum tubes and associated circuits.

Prerequisites: Physics 3b; Mathematics 20b. (3) (Crawley)

115—THEORY OF MEASUREMENTS. A course in analysis of experimental data. Some of the topics considered will be to find 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, etc.

Prerequisites: Physics 104; Mathematics 20b. (3) (Staff)

119—X-RAYS AND CRYSTAL STRUCTURE. A basic course in X-rays for the advanced undergraduate and graduate, dealing with the production and properties of X-rays, 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; Mathematics 20b. (3) (Pardue)

120—X-RAY TECHNIQUE. An introductory 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) (Crawley)

123a—HEAT AND THERMODYNAMICS. This course will stress 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; Mathematics 20b.

(3) (Koppius)

123b—HEAT AND THERMODYNAMICS. A continuation of Physics 123a. 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 study of the use and properties of various light sources, prism and grating spectrographs, photographic materials, and photometric methods. Qualitative and quantitative analysis of unknown materials by spectrographic methods will be made.

Prerequisite: Physics 110 or

(2) (Hanau)

permission of the instructor.

131—EXPERIMENTAL PHYSICS: ELECTRICITY AND MAGNETISM. The course provides advanced laboratory practice 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: Physics 111 or equivalent.

(2) (Crawley)

134—EXPERIMENTAL PHYSICS: VACUUM TUBES. The course deals with the measurements of circuit and vacuum tube

constants, and the experimental study of amplifiers, a. f. and r. f. oscillators, pulse generators, saw-tooth generators, etc.

Prerequisites: Physics 114 or equivalent (2) (Crawley)
(may be taken simultaneously).

135—EXPERIMENTAL PHYSICS: ATOMICS AND NUCLEONICS. Methods of producing and detecting nuclear particles will be studied. Instruments to be employed in the measurements are ionization chambers, Geiger counters, cloud chambers, photographic films, mass spectrographs, and Van de Graaff generator. Measurements will be made on half-lives, absorption coefficients, ranges, particle energies. The experiments include methods appropriate to alpha particles, electrons and positrons, photons, neutrons, fission fragments and mesons.

Prerequisites: Physics 155 or equivalent (2) (Pardue)
(may be taken simultaneously).

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, types of radiation pyrometers. 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, etc.

Prerequisite: Physics 123a or equivalent (2) (Koppius)
(may be taken simultaneously).

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 the instructor. (2) (Hanau)

155a—FUNDAMENTAL ATOMIC AND NUCLEAR PHYSICS. This course will stress 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; Mathematics 20b. (3) (Pardue)

155b—FUNDAMENTAL ATOMIC AND NUCLEAR PHYSICS.

A continuation of Physics 155a in which a more detailed and more theoretical study of nuclear structure will be made. Topics treated are: 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, including the theorems of Clausius, Joule, Maxwell and Boltzmann. Coefficients of viscosity and slip. Brownian movements and specific heat relations are treated from the kinetic theory standpoint and equations of change of state are developed.

*Prerequisites: Two "100" courses in Physics;
Mathematics 105a.*

(3) (Koppius)

208—MICROWAVES. A review of electro-magnetic 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. Lectures and assigned problems.

Prerequisites: Mathematics 105a; Physics 111,

(3) (Crawley)

Electrical Engineering 133 or equivalent.

210—ELECTRODYNAMICS. A treatment of the subject from the relativity point of view and on the electron theory. The topics treated will be 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 electron. The course will end with a short preview of quantum electrodynamics.

Prerequisites: Physics 111; 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 treated include the formation of ions, their mobility, diffusion, and recombination. Representative discharges are studied such as the arc, glow, spark, corona, etc.

*Prerequisites: Physics 111, and either 110
or 155b; 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; Mathematics 105a.

(3) (Hanau)

214—TRANSIENT ELECTRIC AND VACUUM TUBE PHENOMENA. A study of transient currents in circuits containing variable amounts of inductance, capacitance and resistance. Investigation of various types of coupled circuits including vacuum tube circuits. Both the methods of differential equations and of Heaviside's operational circuit analysis are used.

Prerequisites: Physics 111 or 114;

(3) (Crawley)

Mathematics 105a.

215a—QUANTUM THEORY. 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.

Prerequisites: Physics 217a-b or equivalent.

(3) (Pardue)

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) (Pardue)

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; statistical mechanics; thermodynamics; electrodynamics, relativity, quantum theory.

Prerequisites: 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; Mathematics 105a.

(3) (Webb)

220a-h—SEMINAR. A weekly meeting of the staff and advanced students of the department for presentation and discussion of recent developments in physics as reported in the current literatures 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 study of 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)

225—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)

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;

(3) (Webb)

Mathematics 105a.

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 (Price or 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, 3 hours; laboratory, 2 hours.

Prerequisite: Agricultural

Entomology 1.

(3) I (Price or Townsend)

104—ECONOMIC ENTOMOLOGY. Farm Crop Insects and Insect 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 (Price or 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, and

any one of the following:

102, 103, 104.

(3) I, II (Price or Townsend)

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, 103, 104,

and 105a-b.

(3) I, II (Price)

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, Bot. 1b. (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. 1a. (2) II, S (Phillippe)

104—ADVANCED CROPS: FORAGE CROPS. A comprehensive study of forage crops with special emphasis upon their production in Kentucky. Recitations, 3 hours.

Prerequisites: Agr. 1, Bot. 1b. (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, Bot. 1b. (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. 1b, Agr. 1, A. I. 61. (3) II (Kinney)

200a-c—SEMINAR. (1) I, II (Agronomy Staff)

204a-b—SPECIAL PROBLEMS IN PRODUCTION OF FORAGE CROPS. Intensive studies of research relative to particular problems in forage crop production.

Prerequisite: Approval by instructor. (3) II, S (Fergus and Phillippe)

205a-b—SPECIAL PROBLEMS IN PRODUCTION OF TOBACCO OR CEREALS.

Prerequisite: Approval 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; Bact. 52. (3) I

112a-b—SPECIAL PROBLEMS IN SOILS. Intensive studies of specific soil problems.

Prerequisites: Agr. 10 and approval 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 approval of instructor. (3) II

200a-c—AGRONOMY SEMINAR.

(1) I, II (Agronomy Staff)

212a-d—RESEARCH IN SOILS. Each course offered each quarter, but only three hours may be taken in a quarter.

Prerequisite: Approval of instructors. (3) I, II, S (Karraker)

COURSES IN PLANT PATHOLOGY

200a-c—SEMINAR.

(1) I, II (Agronomy Staff)

FARM ENGINEERING

101a-d—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 approval by instructor. (2) I, II, S (Kelley, Young)

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. Lectures and recitations, 2 hours.

Prerequisites: 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. Lectures and recitations, 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)

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, A. I. 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, A. I. 2, and approval of instructor. (3) I (Johnson)

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 A. I. 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 A. I. 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 A. I. 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 A. I. 81. (3) I (Wilford)

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)

106a-c—SPECIAL PROBLEMS IN ANIMAL HUSBANDRY.
Approval of instructor required.

(3) I, II, S

(Animal Husbandry Staff)

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)

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

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. Lectures, 2 hours; laboratory, 2 hours.

Prerequisite: A. I. 81 or 181.

(3) I

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 A. I. 23.

(3) I

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)

126—MARKET MILK AND CHEESE. This course includes principles involved in the production and processing of milk and a study of problems in the manufacture of several types of hard and soft cheese. Lecture, 3 hours; laboratory, 6 hours.

Prerequisite: A. I. 21.

(5) II (Morrison)

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)

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 A. I. 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.

Prerequisite: A. I. 41.

(3) I, S (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.
Prerequisite: A. I. 41 and M. & R. F. 100.

This is the same course as

M. & R. F. 142.

(2) I (Wightman and Roberts)

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.
Prerequisite: A. I. 41 and A. I. 44. (3) I (Wightman)

149a-c—SPECIAL PROBLEMS IN POULTRY.

Approval of instructor required.

(3) I, II, S (Wightman)

241a-c—RESEARCH IN POULTRY. Problems involving original investigation. (3) I, II, S (Wightman)

Note.—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 A. I. 161. (3) II (Steele)

169a-c—SPECIAL PROBLEMS IN GENETICS.

Approval of instructor required.

(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

181—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 (Forbes)

182—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 (Forbes)

183—ADVANCED ANIMAL NUTRITION. History and development of nutritional theories and techniques; a critical review of current literature. Lecture and recitation, 3 hours.

Prerequisites: A. I. 181. (3) II (Forbes)

189a-c.—SPECIAL PROBLEMS IN ANIMAL NUTRITION. *Approval of instructor required.* (3) I, II, S (Forbes)

281a-c—RESEARCH IN ANIMAL NUTRITION. Problems involving original investigation. (3) I, II, S (Forbes)

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 (Hull)

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. Lectures, 3 hours.

Prerequisites: A. P. 101 and approval by instructor.

(3) II (Dimock)

104a-b—SPECIAL PROBLEMS IN ANIMAL PATHOLOGY. *Prerequisites:* A. P. 101, and 102 and approval by instructor. (3) I, II (Hull, Dimock)

201a-b—INVESTIGATIONS IN ANIMAL DISEASES. This course is open only to persons who have a degree in veterinary medicine.

Prerequisites: A. P. 101, 102 or equivalent. (3) I, II (Hull, Dimock)

ECONOMIC AND SOCIAL ASPECTS OF AGRICULTURE

Courses are offered in the fields of agricultural economics and 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.

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.

Prerequisite: *Farm Economics 110 and approval of instructor.* (3) I (Nicholls)

112a-c—SPECIAL PROBLEMS IN FARM MANAGEMENT. Students are assigned a special problem in the field of farm economics.

Prerequisite: *F. E. 110 and approval 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.

Prerequisite: *Farm Economics 110 and approval 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 approval 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 (3) II (McComas)
or approval of instructor.

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 see \$10.00.

Prerequisite: Farm Economics 120. (2) I (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: Approval of (3 ea.) I, II, S (Nicholls and Staff)
instructor.

202a-b—ECONOMICS OF PRODUCTION AS APPLIED TO AGRICULTURE. This course places emphasis upon the fundamental consideration essential to the study of production organization in the economy of modern agriculture. Theoretical analysis will be applied to such questions as the combination of the agents of production, scale and intensity of production, comparative advantage and interregional analysis, and as an evaluation of national agricultural policies and programs.

Prerequisite: Approval of instructor. (3, 3) II, S (McComas)

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: Approval of instructor. (3) II, S (McComas)

204—RESEARCH METHODS IN FARM MANAGEMENT. 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.

Prerequisite: Farm Economics 110

(3) II (McComas)

and approval of instructor.

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 (Brown, 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 (Vennes)

102—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, 2 hours.

Prerequisite: Markets and Rural Finance 100. (2) S (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 (Vennes)

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, Vennes)

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) S (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 (Card)

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) II (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.

Prerequisite: Animal Industry 41 and Markets and Rural Finance 100. This is same course as Animal Industry 142.

(2) I (Roberts, 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: Approval 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) II (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

(3) II (Brown)

Finance 110, or approval of instructor.

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) I (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) I (Card)

240—EFFECTS OF POLITICAL, ECONOMIC AND CULTURAL FORCES ON RURAL LIFE IN AMERICA. A course for graduate students in the heritages and political and economic forces that have affected the life and property of the people engaged in agriculture. The period covered is from colonial times to the present. Lectures, readings and assigned topics, two hours a week.

(2) I (McVey)

RURAL SOCIOLOGY

115—ORGANIZATION OF RURAL GROUPS. A Study of leadership, membership participation, and program planning in agricultural organizations and other organized rural groups.

*Prerequisite: An introductory course
or consent of instructor.*

(3) II, S

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 consent of instructor. (3) I

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 consent of instructor. (3) I, II

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 approval of instructor. (3) I, S

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 consent 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: Approval 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: Approval of instructor. (3) II

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: Approval 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; sociology of rural groups.

Prerequisite: Approval of instructor.

(3) II (Staff)

SOCIOLOGY (See Social Sciences.)

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. Lectures, 3 hours.

Not open to home economics majors.

(3) II, S (Erikson)

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. Lectures, 2 hours; laboratory, 4 hours.

Prerequisite H. E. 6 and 11.

(4) I, II, S (Wooldridge)

103a, b—PUBLIC SCHOOL NUTRITION. Study of nutrition education movement with emphasis on causes and effects of malnutrition, methods of judging nutrition and height and weight standards. Development of health programs in public schools. Lecture, 1 hour; laboratory, 2 hours.

Prerequisite or parallel:

(2) I, II, S (Wooldridge)

H. E. 102.

103c, d—PUBLIC SCHOOL NUTRITION. Opportunities are given to make and collect illustrative material for courses in applied nutrition. Observations of nutrition classes, school cafeterias and other nutrition projects are made. Laboratory, 2 hours.

Prerequisite or parallel:

(1) I, II, S (Wooldridge)

H. E. 103a or 103b.

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.

Prerequisite: Chem. 37, H. E. 5 or (3) I, II, S (Wooldridge)
approval of instructor.

106a, d—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.

Prerequisite: H. E. 103a or 103b, (1) I, II, S (Wooldridge)
or approval of instructor.

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) S (Erikson)

108a, d—SEMINAR IN NUTRITION. Investigations of recent research in nutrition.

Prerequisite: Senior or (2) I, II, S (Erikson)
graduate standing.

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. (6) I, Alternate S (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.

Prerequisite: H. E. 102, (4) I, Alternate S (Erikson)
H. E. 111 or taken concurrently.

114—FOOD PRESERVATION. The principles of preserving food for 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) S (Helton)

200a, d—SEMINAR IN NUTRITION. (2) I (Erikson)

206a, d—ADVANCED FIELD WORK IN NUTRITION. The course is a continuation of H. E. 106a, d with investigations of recent research in the field. Lecture and laboratory.

Prerequisite: H. E. 103, H. E. 106a. (1) I, II, S (Wooldridge)
or approval of instructor.

COURSES IN CLOTHING, TEXTILES, AND RELATED ART

125—ADVANCED TEXTILES. Individual term problems. Lecture, 1 hour; Laboratory, 2 hours.

Prerequisite: H. E. 25 and (2) I, Alternate S (Summer)
H. E. 161.

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.

Prerequisite: H. E. 27, Art 30a, (3) I, Alternate S (Seeds)
Art 30b, Art 30c.

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 (Seeds and
Summer)

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.

Prerequisite: H. E. 25, Art 30a, (3) II, Alternate S (Seeds)
Art 30b, Art 30c, H. E. 61
or approval of instructor.

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 (Seeds)

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 (2) II, Alternate S (Summer)
Art 30a, 30b, Art 30c.

137—TAILORING. Analysis of tailoring technique in the shop and in the home. Tailored garments are planned and constructed. Laboratory, 4 hours.

Prerequisite: H. E. 127.

(2) I, Alternate S

138—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.

Prerequisite: H. E. 127 and H. E. 161.

(2) II, Alternate S

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 (Seeds)

180a, d—SPECIAL PROBLEMS IN TEXTILES AND CLOTHING OR COSTUME OR INTERIOR DECORATION. Intensive work on specific phases of each of these fields.

(2) I, II (Seeds and Sumner)

237a, d—SEMINAR IN TEXTILES AND CLOTHING OR COSTUME OR INTERIOR DECORATION. Investigation of special textile, clothing, or interior decoration problems. Lecture, 2 hours.

(2) I, II (Seeds and Sumner)

280a, d—SPECIAL PROBLEMS IN TEXTILES AND CLOTHING OR COSTUME OR INTERIOR DECORATION. Intensive work, with more individual investigation, on specific phases of each of these fields.

Prerequisite: Graduate standing.

(2) I, II (Seeds and Sumner)

COURSES IN INSTITUTION MANAGEMENT

140—THE SCHOOL LUNCH. This course is 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 will be studied. Duties of the manager in formulating employment policies and personnel management will be seen. 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.

Prerequisite: H. E. 5; 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.

Prerequisite: H. E. 41 and H. E. 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 (each unit a-c).

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, 3 hours; laboratory, 2 hours.

(3) II (Helton)

175a, d—SPECIAL PROBLEMS IN INSTITUTION MANAGEMENT.

(2) I, II (Helton)

275a, d—SPECIAL PROBLEMS IN INSTITUTION MANAGEMENT.

(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.

Prerequisite: A. & P. 3; Psych. 7;

(3) I, II (Bentley)

*Sufficient morning hours
open for laboratory.*

154—FAMILY LIVING. The interlocking 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, 3 hours and occasional field trips in the local community.

(3) 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) Alternate 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) Alternate 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. 3.

(2) S (Mumford)

190a, d—SPECIAL PROBLEMS IN CHILD DEVELOPMENT AND FAMILY LIVING. (2) I, II (Mumford and Bentley)

290a, d—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;
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 the mechanics of time, energy and money management. Emphasis is placed on personal development, social and family relationships. Lecture, 2 hours.

Prerequisite: Econ. 1; 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 parallel, H. E. 102.

195a, d—SPECIAL PROBLEMS IN HOME MANAGEMENT.

(2) I, II (Wilmore)

295a, d—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)

GENERAL COURSES

160—RURAL COMMUNITY ANALYSIS. The nature of the town-country 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 and (3) I, II
consent of instructor.

HOME ECONOMICS EDUCATION (See Education.)

HORTICULTURE

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, 2 hours; laboratory, 2 hours, first half; lectures, 3 hours a week, last half.

Prerequisite: Horticulture 1. (3) I (Waltman)

106a-c—SPECIAL PROBLEMS IN POMOLOGY. This course is designed to meet the need for advanced work.

Prerequisites: Horticulture 1, 103, 104, (3) I, II (Waltman)
105, and approval of instructor.

110—PRINCIPLES OF VEGETABLE GARDENING. A study of fundamental principles underlying commercial production of vegetables. Lectures, 2 hours; laboratory, 2 hours.

Prerequisites: Horticulture 1 (3) I (Emmert)
and Agronomy 10.

111—GROWING VEGETABLE PLANTS UNDER GLASS. Production of vegetable plants grown for transplanting; types of hot-beds, 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, 110, (3) I, II (Emmert)
and approval of instructor.

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, 3 hours; laboratory, 2 hours. Offered 1949 and on alternating years, thereafter, and every summer.

(4) II (Elliott)

121—ADVANCED LANDSCAPE. A continuation of Horticulture 120, with special emphasis on design and use of materials. Lectures, 2 hours; laboratory, 2 hours.

Prerequisite: Horticulture 120. (3) II (Elliott)
Offered 1950 and on alternate
years, thereafter.

122—FLORICULTURE. A detailed study of specific groups of flowers such as bulbs, iris, and roses. Lectures, 2 hours. Offered 1949 and on alternate years thereafter.

(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.

Prerequisites: Horticulture 1; Botany 1a, 1b. (3) II (Elliott)
Offered 1950 and on alternate years thereafter.

124a-c—SPECIAL PROBLEMS IN ORNAMENTAL HORTICULTURE. This course is designed to meet the need for advanced work.

Prerequisites: Horticulture 1, 120, 121; (3) I, II (Elliott)
Botany 1a, 1b, and approval
of instructor.

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 1949 and on alternate years thereafter.

Prerequisite: Horticulture 120. (2) II (Elliott)

200a-c—SEMINAR. (1) I, II (Olney and Staff)

201a-c—SEMINAR. RESEARCH IN HORTICULTURE.

Prerequisite: Approval (3) I, II (Olney and Staff)
of instructors.

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; (3) I (Davenport)
Botany, 124.

111—LUMBER AND OTHER FOREST PRODUCTS. Manufacture, grading, and seasoning of lumber. Forest products other than logs or lumber, their methods of utilization.

Prerequisite: Forestry 110. (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, (3) I, II (Davenport)
and approval of instructor.

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 14 to 18 of this Bulletin.

There are two plans of work leading toward the degree of Master of Arts in Education and Master of Science 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-half of the credit and residence requirements must be met while the student is 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) must be made on all graduate work.

PLAN II

1. A minimum of 36 semester hours of graduate work must be completed.
2. At least 18 semester hours of graduate work must be in education.
3. At least 18 semester hours must be in courses numbered 200 or higher.
4. At least 45 weeks must be spent in residence at the University of Kentucky as a graduate student.
5. At least one-half of the credit and residence requirements must be met while the student is 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) must be made on all graduate work.

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, Spain
Secondary Teachers	
General.....	Hartford, Dickey, Sorenson
Agriculture.....	Hammonds, Tabb, Wall
Art.....	Ginger, Haines, Rannells
Business Education.....	Thomas, Humphreys, McMurtry
Home Economics.....	Parker, Sneed
Music.....	Ginger, Stallings
Physical Education.....	Ginger, Seaton, Clay, Gilb
Elementary Principal.....	Hartford, Duncan, Spain
Secondary Principal.....	Cherry, Hartford, Dickey
Supervisor.....	Spain, Cherry, Duncan
Attendance Officer.....	Meece, Cherry, Sorenson
Superintendent.....	Cherry, Meece, Sorenson

SUGGESTED GRADUATE CURRICULA

<i>For Superintendents</i>		<i>Semester Hours</i>
Ed 201	Foundations in Education.....	5
Ed 202	Local School Administration	3
Ed 211	The Administration of Vocational Education	3
Ed 221a, b	Seminar in Administration.....	4 each
Ed 225	Supervision of Instruction	4
Ed 227	Principles of Curriculum Construction	4
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 211	The Administration of Vocational Education	3
Ed 212	The Elementary School	3
Ed 214	The Secondary School	3
Ed 225	Supervision of Instruction	4
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	4
Ed 227	Principles of Curriculum Construction	4
Ed 229	The Elementary Principal	3
Ed 292a, b	Field Problems in Curriculum and Supervision	4 each

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	4
Ed 227	Principles of Curriculum Construction	4
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	4
Ed 227	Principles of Curriculum Construction	4
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	4
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	4
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, b	Problems in Business Education	3 each
Ed 222	Methodology of Educational Research	3
Ed 257a, b	Seminar in Business Education	1 each
Ed 259	The Commerce Curriculum	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 (Cherry and 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 (Cherry)

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 (Cherry, 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 its equivalent.

(3) (Cherry)

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.

Prerequisite: Education 202 and 225 or equivalent.

(4) II, S (Cherry, Meece)

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 THE TEACHING PERSONNEL. A specialized course in school administration, primarily for prospective superintendents. 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) (Cherry)

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) (Cherry)

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 (Cherry, 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 (Taylor,
Chamberlain, Seay)

DIVISION OF FOUNDATIONS OF EDUCATION

119—THE ELEMENTARY SCHOOL PUPIL. The psychology of the child in the primary and intermediate grades.

Prerequisite: one quarter of psychology. (2) I, S (Sorenson)

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)

147—THE SECONDARY SCHOOL PUPIL. The psychology of the pupil in junior and senior high school.

Prerequisite: One quarter of psychology. (2) II, S (Sorenson)

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)

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 (Taylor)

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 (Taylor, Sorenson)

223—EDUCATIONAL STATISTICS. A non-mathematical 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 (Taylor)

230—EDUCATIONAL SOCIOLOGY. The sociological foundations of education. Topics include: the role of the school and contributions of non-school educative agencies, home-school-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 (Taylor, 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

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)

DIVISION OF INSTRUCTION AND PLACEMENT BUSINESS EDUCATION

104—FOUNDATIONS OF BUSINESS EDUCATION IN THE HIGH SCHOOL. The origin, the status, and the objectives of business education in the secondary school. Required of business education majors. (3) I, II, S (Hoover)

158a—TEACHING SECRETARIAL SUBJECTS. Special techniques and devices for teaching shorthand, typewriting, and secretarial office practice. Required of business education majors.

(2) II, S (Hoover)

158b—TEACHING ACCOUNTING. Methods, materials, and techniques used in the teaching of accounting. Required of business education majors.

(2) I, S (Hoover)

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 (Hoover)

192—TEACHING GENERAL BUSINESS SUBJECTS IN THE SECONDARY SCHOOLS. The aims and purposes of the general business course are studied. Analysis is made of the objectives of the general business subjects, and methods and materials used in teaching them are emphasized.

(2) S (Hoover)

194—TEACHING CONSUMER COURSES IN THE HIGH SCHOOL. Methods, materials, and techniques of teaching high school pupils the various aspects of consumer education. Emphasis is placed on procedures and the student should have a background of training in economics before taking the course.

(3) I, S (Hoover)

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 (Hoover)

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 (Hoover)

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 (Hoover)

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 (Hoover)

270—BUSINESS TEACHER EDUCATION IN COLLEGES AND UNIVERSITIES. A survey of business teacher education in public and private colleges, teacher colleges, and universities. Major emphasis is placed upon the development of curricula which will meet certification requirements in the various states, and improve secondary business education. (3) S (Hoover)

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 (Hoover)

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 (Hoover)

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 (Hoover)

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, Robinson)

127—THE ELEMENTARY CURRICULUM. The philosophy and techniques of curriculum construction and some practical work in construction. (3) (Spain)

157a-f—MODERN EDUCATIONAL PROBLEMS. A brief survey of some of the problems in modern education. (3)

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)

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)

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 (Clifton, Godbey)

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) (Taylor)

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 (Duncan)

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. (4) II, S (Spain)

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)

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. (4) I (Spain)

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 (Spain)

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 (Clifton)

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) (Clifton)

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

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.

(4) I, II (Spain)

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 (Spain)

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; 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 (Adams)

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)

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)

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 (Duncan)

308a, b—RESEARCH PROBLEMS IN ELEMENTARY EDUCATION. An independent research course. Students confer individually with the instructor. (3) I, II (Duncan)
Prerequisite: One year of graduate work.

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)* (Capurso, Lewis)

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)* (Capurso, Lewis)

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)* (Capurso)

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 (Dickey)

* Offered according to demand.

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.

(6) 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, 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 (Anderson, Neubauer, 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)

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)

* 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.

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, Neubauer, 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.

(3) I, II (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.

(3) 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 (Dickey)

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)

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, Dickey)

* 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.

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, Dickey)

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 (Tabb)

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

(3) I, II (Parker)

26, 27, and 61; *Education* 147.

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)

165—ADULT EDUCATION IN HOME ECONOMICS. Problems in teaching vocational homemaking in day, part-time, and evening schools.

Prerequisite: Education 160;
parallel 162.

(3) I, II, S (Parker, Averitt,
Monical, Smith)

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.

Prerequisite: Education 160 and 162;
experience in teaching;
approval of instructor.

(3) I, S (Parker)

263—CURRENT PROBLEMS IN HOME ECONOMICS EDUCATION. Recent developments in home economics education.

Prerequisite: Education 160 and 162;
experience in teaching.

(3) II, S (Parker, Sneed)

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 school 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.)

Prerequisite: Two years teaching experience; recommendation by 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 the teachers, principals, superintendents, and welfare workers 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) (Hankins, Crumpton)

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 (Hankins, Crumpton)

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 (Hankins, Crumpton)

137—SPECIAL PROBLEMS IN INDUSTRIAL EDUCATION. The supervised study of approved problems in industrial education on a research basis.

(2) I, II, S (Hankins, Crumpton)

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 (Hankins, Crumpton)

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 (Hankins, Crumpton)

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 (Hankins, Crumpton)

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 or Master of Science in Education may be obtained with the elective courses taken in physical

education. In this case the requirements as set out on page 11 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—even years (Seaton)

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, Lancaster)

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 consent 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 (Hackensmith, Murray)

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) I, S—odd years (Johnson, Staff)

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)

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) II, S—even years (Seaton)

169a, b—STUDENT TEACHING IN PHYSICAL EDUCATION. See Secondary Education, College of Education. (3 ea.) I, II (Gilb, Clay, Ginger, Kauffman)

172—KINESIOLOGY. Study of muscular and mechanical factors in bodily movements. Three hours per week lecture. *Prerequisite: Anatomy and Physiology 4 and 5.* (3) I (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 (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 consent 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. *Prerequisites: Physical Education 80.* (3) II, S—even years (Kauffman)

181—CAMPING IN EDUCATION. Purpose, history, organization, and conduct of camps of various types. *Prerequisites: Physical Education 81 or permission of instructor.* (2) I, S—even years (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. (2) II, S—even years (McCubbin, Murray)

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) I, 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) I (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) II (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—odd years (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—odd years
(Shively, Seaton)

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—even years (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 consent 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)

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.

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.

Prerequisite: Applied Mech. 3 (4) I, II, S
and Math. 20b. (Hawkins, Barber, Adams)

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: Math. 20b and (3) I, II, S
Applied Mech. 100. (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.

Prerequisite: Applied Mech. 4 and (4) I, II (Hawkins)
Applied Mech. 100. Prerequisite
and 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.

Prerequisite: Chem. 1a, Physics 3a.

(3) (Nollau)

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 (Baker)

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 of Civ. Eng. 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.

Prerequisite: Applied Mech. 100 and Applied Mech. 4.

(2) I, II (Cheek)

123—HYDRAULICS LABORATORY. Experimental investigation of flow of water in pipes, channels, over weirs, 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.

Prerequisite. 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.

Prerequisite. 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:

(3) I, II (Mory)

Applied Mech. 100.

171b—THEORY OF STRUCTURES. Continuation of Civ. Eng. 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 Civ. Eng. 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:

(2) I, II (Mory)

Civ. Eng. 171a.

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 ea.) I, II (Mory)

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 ea.) I, II (Chambers)

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 ea.) 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 ea.) 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 ea.) 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 ea.) 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: Approval of

(3 ea.) (Staff)

Head of the Department.

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.

Prerequisite: 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,

(3) I (Bureau)

Elec. Eng. 105b or Elec. Eng. 101.

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.

Prerequisite: Elec. Eng. 116 (3) II (Romanowitz)
and Elec. Eng. 161.

110—ELECTRICAL LABORATORY. (For Electrical Engineers.) Formal studies of electrical machinery characteristics. Laboratory, two hours.

Concurrent: Elec. Eng. 116. (1) 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.

Prerequisite: Elec. Eng. 21 (4) I, II (Staff)
and Math. 20b.

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.

Prerequisite: Elec. Eng. 21 (3) I (Staff)
and Math. 20b.

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.

Prerequisite: Elec. Eng. 114 (4) II (Staff)
and Elec. Eng. 115.

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.

Prerequisite: Elec. Eng. 114 (3) II (Allison, Romanowitz)
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.

Prerequisite: Elec. Eng. 116 (2) I, II (Barnett, Bureau)
and Math. C105a.

124—ELECTRICAL DESIGN. Special problems in D. C. and A. C. machine design. Calculating room, six hours.

Prerequisite: Elec. Eng. 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. (4) I (Allison, Romanowitz)
Concurrent: Elec. Eng. 120.

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.

Prerequisite: Physics 3b and (3) I (Romanowitz)
Math. 20b.

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.

Prerequisite: Elec. Eng. 116 or (3) II (Barnett, Bureau)
equivalent, and Math. 20b.

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 ea.) 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.

(1 ea.) 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 ea.) 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. Resonance phenomena at radio frequencies; coupled circuits and impedance transformation; radio frequency amplifiers, tuned, narrow band IF, linear amplifiers; modulation, AM and FM; detection; superheterodyne receiver circuit. Lecture and recitation, 3 hours; laboratory, three hours.

Prerequisite: Elec. Eng. 161.

(4) I (Staff)

163—RADIO ENGINEERING II. Transmitting tube performance, transmitter circuits; RF lines, antenna feeding, antenna characteristics; wide band amplifiers, square wave testing; pulse generators and circuits. Lecture and recitation, three hours; laboratory, three hours.

Prerequisite: Elec. Eng. 162.

(4) II (Allison, Romanowitz)

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. 120.

(2) II (Romanowitz)

and Elec. Eng. 114.

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)

211—ELECTRICAL CIRCUIT ANALYSIS—TRANSIENTS. Mathematical study of transient electric phenomena. Recitation, three hours.

Prerequisites: Elec. Eng. 120, (3) (Bureau)
Elec. Eng. 116 and Elec. Eng. 135.

212—SERVOMECHANISMS. An analytical study of the characteristics of various types of servomechanisms. Lecture and recitation, three hours.

Prerequisites: Elec. Eng. 107, Elec. (3) (Bureau)
Eng. 108 and Elec. Eng. 211.

221—ADVANCED ELECTRONICS. High vacuum tubes; electron flow, thermionic emission, transit time effects. Gas tubes: performance of mercury vapor rectifiers, thyratrons, ignitrons, and ionized gas light sources. Lecture and recitation, three hours.

Prerequisites: Elec. Eng. 161 (3) (Romanowitz)
and Elec. Eng. 120.

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. 135 (3) (Romanowitz)
and Math. 120.

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 (3) (Romanowitz)
and Elec. Eng. 165.

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)

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: Approval of Head of (3 ea.) (Staff)
the Department.

MECHANICAL ENGINEERING

100a—MACHINE DESIGN. Design of machine and structural elements. Lecture and recitation, three hours.

Prerequisites: Eng. Draw. 18, Mech. Eng. (3) I, S (Carter)

15b. *Prerequisite or concurrent:*

Applied Mech. 100.

100b—MACHINE DESIGN. Continuation of Mech. Eng. 100a. Drawing room, nine hours.

Prerequisite: Mech. Eng. 100a. (3) I, II, S (Carter)

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 (3) I, S (Penrod)
and Math. 20b.

104b—ENGINEERING THERMODYNAMICS. Continuation of Mech. Eng. 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 (Stewart)

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)

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 (4) II (Meyer)
Mech. Eng. 134.

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: Mach. Eng. 104b.
or Mech. Eng. 134.

(3) I, S (Knight)

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)

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
Mech. Eng. 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.

Prerequisite: Mech. Eng. 104b and
Mech. Eng. 107.

(2) I (Staff)

113b—MECHANICAL LABORATORY. Continuation of Mech. Eng. 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: Mech. Eng. 109.

(3) I (Knight)

114b—AIR CONDITIONING, HEATING AND VENTILATING DESIGN. Continuation of Mech. Eng. 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)

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.

*Prerequisite: Physics 3b and
Junior Classification.*

(3) II (Knight)

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: Senior
Classification.*

(1) I (Penrod, Knight)

122b—SEMINAR. Continuation of Mech. Eng. 122a. Two hours a week.

*Prerequisite: Senior
Classification.*

(1) II (Penrod, 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 (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 Mech. Eng. 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 Mech. Eng. 131a. Lecture and recitation, three hours.

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

(3) I (Staff)

Math. 20b.

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)

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 ea.) (Meyer)

202a-d—POWER PLANT ENGINEERING. Advanced work in the design, selection, layout and operation of heat-power plant equipment.

(3 ea.) (Penrod)

203a-d—HEATING, VENTILATING, AND AIR CONDITIONING. Advanced work in the design, selection, layout and operation of heating, ventilating, and air conditioning equipment.

(3 ea.) (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 ea.) (Carter)

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: Approval of the Head
of the Department.

(3 ea.) (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.

Prerequisites: Mech. Eng. 104c or (4) I, II (Penrod)
consent of the instructor.

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 (4) I (Penrod)
consent of instructor.

212b—ADVANCED FLUID MECHANICS. Continuation of Mech. Eng. 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 (4) I (Penrod)
Mech. Eng. 129 or the equivalent.

213b—ADVANCED HEAT TRANSFER. Continuation of 213a.

Prerequisite: Mech. Eng. 213a. (4) II (Penrod)

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. (2) I, II (Kendall)
Eng. 27

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 (5) I, II (Crouse)
and Met. Eng. 128.

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 2b, Chem. 21a. (3) I, II (Crouse)
and Met. Eng. 29.

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, three hours.

Prerequisites: Met. Eng. 60. (3) I (Orrell)
and Met. Eng. 140.

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 (3) I (Orrell)
and Met. Eng. 140.

143b—PHYSICS OF METALS. This is a continuation of Met. Eng. 143a without the laboratory. Lecture and recitation, three hours.

Prerequisite: Met. Eng. 143a. (3) II (Orrell)

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 (Orrell)

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 Met. Eng. 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 Metallurgical Engineering.

(1 ea.) I, II (Staff)

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, Orrell)

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 (Crouse, 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, Orrell)

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

(6) I, II (Crouse))

*in Physics, Chemistry and Metallurgy,
this background to be determined by
the Head of the Department after
consultation with the student.*

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 (Orrell)

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.

215—ALLOY STEELS. The thermal behavior of low and high alloy steels is discussed on the basis of each particular phase diagram. The sub-critical 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, Orrell)

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 (Orrell)

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 (Orrell, 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 (Orrell)

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 ea.) 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)

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, mine surveying 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 shaft sinking and other development operations, underground mining methods, mechanical loading, placer mining, open cut mining, coal stripping, compressed air practice, accident prevention, transportation, hoisting and related techniques. Lecture and recitation, five hours and four hours respectively, with assigned reference reading and reports.

Prerequisite: Min. Eng. 126.

(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 (Carter)

175a, b—SEMINAR. This course includes general round table discussion 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 ea.) I, II (Carter)

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 ea.) I, II (Carter)

VIII. FINE ARTS

ART

As prerequisite to the master's degree, the Department of Art requires preliminary work in art equivalent to that required of its majors in art. In general this means the completion of an undergraduate sequence of six to eight courses in drawing and painting or design balanced by from four to six courses in the history of art, and a reading knowledge of French or German. Graduate work for the master's degree may emphasize technical study in the fields of painting or design or non-technical study in the history of art or the criticism of art. In either case a 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.

Prerequisite: 65a, 63.

(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)

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)

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)

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)

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)

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)

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: 63, 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: 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 collabor-

ration 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 (Staff)

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.

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. Students possessing a Bachelor's degree in a field other than music may qualify as a candidate for the Master of Arts Degree with a major in music after completing the following undergraduate prerequisites in music at an accredited institution:

1. Elementary Harmony, Sightsinging and Dictation 8 semester hours
2. Advanced Harmony, Sightsinging and Dictation 8 semester hours
3. Counterpoint 4 semester hours
4. History of Music 6 semester hours
5. Applied Music 24 semester hours
6. Form and Analysis 4 semester hours
7. Instrumentation and Conducting or Choral Conducting 2 to 4 semester hours

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.

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)*

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) (Capurso)*

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) (Capurso)*

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 34b and 13b.* (2 ea.) (Capurso)*

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 12b and 34b.* (2 ea.) (Capurso)*

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) (Lewis)*

204—ADVANCED BAND TECHNIQUE. An advanced course in band technique with concentration on band organization and materials, the technique 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) (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) (Capurso)*

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, philo-

* Offered according to demand.

sophic, 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) (Capurso)*

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) (Capurso)*

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) (Capurso)*

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.

Prerequisite: Music 114a or the approval of the instructor.

(2) (Capurso, 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 114a, b or with the permission of the instructor.

(2) (Capurso, Prindl)*

215a, b, c—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 lesson 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.

Prerequisites: Eight Semester hours of accredited undergraduate study in Applied Music, Piano.

(2) I, II S (Montgomery, Morgan)

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

* Offered according to demand.

sonatas and concertos of 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 accredited undergraduate study on the string instrument in which graduate work is desired.

(2) I, II, S (E. Adams)

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 accredited undergraduate study in voice.

(2) I, II, S (Pinnell, Kiviniemi)

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 undergraduate study in organ.

(2) I, II, S (Cullis)

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 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 114a Orchestration	2 semester hours

Music 114b Instrumental Conducting and Score Reading	2 semester hours
Music 115 Choral Methods and Conducting	2 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 215a, b, Piano	2 semester hours*
Music 216a, b, Strings	2 semester hours*
Music 217a, b, Voice	2 semester hours*
Music 218a, b, Organ	2 semester hours*
Advisers: Capurso, Taylor	

* Not more than four credits will be allowed in graduate applied music.

In addition to the foregoing curriculum, a thesis consisting of an approved problem in the field of Music Education will be required.

A student, wishing to complete the degree requirements on a thirty-six hour basis without a thesis, must select courses at the "200 level" in the amount of eighteen 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, Capurso)*

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) (Capurso, 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) (Capurso, Lewis)*

* 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.

101a, b—CONTRACTS I and II. Williston's Cases (4th edition). Formation, parties, consideration, formalities, contracts for the benefit of third persons, assignments, joint obligations, conditions—express and implied, impossibility.

(3) I; (3) II (Murray, Nelson)

102a, b—TORTS I, II, Thurston and Seavey's cases (3rd edition). Breach of legal duty, causation, duty of care, contributory negligence, care in the use or occupation of land, extra-hazardous occupations, joint torts, deceit, defamation, slander, libel, privilege, malicious prosecution, interference with social and business relations, inducing breaches of duty, unfair competition, strikes, boycotts, and business combinations.

(3) I; (3) II (Nelson, Oberst)

103—PROPERTY I. Roberts' Cases on Personal Property. Personal Property: possession, the nature and rights of possession, bona fide purchase, purchase by judicial sale, gifts, loss by surrender of possession, assignability, conversion, acts constituting conversion.

(2) I (Matthews)

104—PROPERTY II. Rundell's Cases. Real Property: estates, common law method of creating and conveying estates, Statute of Uses, rights incident to the ownership of land, fixtures, easements, waste, emblements, licenses and covenants running with the land.

(2) II (Matthews)

105—AGENCY, Mechem's Cases. Nature of the relation, competency of parties, appointment, delegation of authority, liabilities of principal and of agent, ratification, undisclosed principal, termination.

(2) II (Evans)

107a, b—CRIMINAL LAW AND PROCEDURE. Hall and Glueck's Cases on Criminal Law. Mikell's Cases. Orfield's Criminal Procedure from Arrest to Appeal. Nature of the crime problem, the theory of punishment, procedure, characteristics of particular crimes.

(2) I (Moreland, Stahr)

121a, b—EQUITY I and II. Chafee and Simpson's Cases Basis of equity jurisdiction, specific performance of contracts, reformation,

reexecution, rescission and cancellation, injunctions in relation to torts, bills of peace, quia timet, interpleaders, position of equity in the legal system. (3) I; (3) II (Moreland)

122—PROPERTY III. Martin's Cases. Titles and Conveyancing: adverse possession, prescription, accretion, execution and delivery of deeds, boundaries, exception and reservation, easements by implication, covenants of title, estoppel, priorities.

(3) I (Matthews)

123—NEGOTIABLE INSTRUMENTS. Britton's Cases on Bills and Notes. Formal requisites of negotiability, acceptance, delivery, endorsement, rights and duties of holder, liability of maker, acceptor, drawer and endorser.

(3) II (Stahr)

141—PARTNERSHIP. Crane and Magruder's Cases. 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.

(2) II (Murray)

142—INDUSTRIAL RELATIONS. Albertsworth's Cases. Relations between employer and employee, the common law background; Employers' Liability Acts and Safety Regulations; Workmen's Compensation. During the latter half of the course a special study is made of the Kentucky Workmen's Compensation Act and Kentucky cases relating thereto.

(2) S (Moreland)

145—INSURANCE. Goble's Cases. Insurable interests, the contract, concealment, representations and warranties, implied conditions, waiver and estoppel, construction.

(2) II (Murray)

147—QUASI CONTRACTS (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) II (Murray)

148—DOMESTIC RELATIONS. McCurdy's Cases. Marriage and divorce, property interests of husband and wife, mutual obligations of the spouses, parent and child.

(2) II (Nelson, Stahr)

149. MUNICIPAL CORPORATIONS. Tooke and McIntire's Cases. Incorporation and existence, municipal officers, revenue, indebtedness, police power, zoning, liability for injuries received upon contracts implied in law and on implied contracts.

(2) S (Randall)

150—PUBLIC UTILITIES. Robinson's Cases (2nd 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) II (Moreland)

152—OIL AND GAS. Kulp's Cases (2nd edition). Nature of landlord's right in oil and gas, interference, measure of damages, the oil and gas lease, drilling operations, storage and use of oil and gas, pipe line and transportation companies, taxation. (2) S (Moreland)

153—TAXATION. Magill and Maguire's Cases. Property, estate, inheritance, gift, income, and excise taxes on business concerns. (3) I (Oberst)

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 (Randall)

160a, b—PRIVATE CORPORATIONS I and II. Dodd and Baker's. Characteristics, formation, powers and liabilities, rights of stockholders, directors, legislative control, dissolution, creditors. (2) I; (2) II (Evans)

161a, b—CONSTITUTIONAL LAW I and II. Dodd's Cases (2nd edition). Division of powers, the dual system of government, scope of federal powers, taxation, money, banking, postal, military and treaty powers, regulation of commerce, the impairment of contracts, jurisdiction of federal courts, the police power, due process of law, equal protection of the law. (2) I; (2) II (Oberst)

162—PROPERTY IV. (Future Interest). Leach's Cases on Future Interests. 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. 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, jurisdiction of probate courts, contracts of personal representatives, claims against the estate and settlement of estates. (2) II (Evans)

164—CONFLICT OF LAWS. Cheatham, Dowling and Goodrich's Cases. Domicile, jurisdiction of courts, procedure, contracts, property, movable and immovable, family law, divorce, inheritance, foreign administration, foreign judgments. (3) II (Moreland)

165a, b—TRUSTS. Scott's Cases (3rd 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) I (Evans)

166—SALES. Woodward's Cases (3rd 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) II (Murray)

167—ADMINISTRATIVE LAW. Stason's Cases. Administrative power and action, administration discretion, notice of hearing, summary action, relief against administrative action, mandamus, certiorari, and other extraordinary legal remedies, equitable relief, jurisdictional limitations, and administrative finality. (3) II (Oberst)

174—CREDIT TRANSACTIONS. Hanna's Cases on Security. This course deals with real estate loans, suretyship, pledges, mortgages, disposition of stocks and bonds, and problems of agricultural finance. (3) II (Stahr)

176—TRADE REGULATION. Oppenheim's Cases. Contracts not to compete at common law; competitive practices; intimidating and molesting; unfair practices; unfair advertising; combinations; the federal statutes. (3) II (Stahr)

177—STATUTORY INTERPRETATION. de Sloovere's Cases. Judicial notice; process of interpretation; subject matter and purpose of the statute; context; associated words; extrinsic aids; relation to other statutes and to the common law; mandatory and directory provisions; operation; effect; repeal. (2) S (Murray)

178—CREDITORS' RIGHTS. Hanna and McLaughlin's Cases. Enforcement of judgments; fraudulent conveyances; general assignments; receivership; bankruptcy; assets, distribution. (3) II (Stahr)

179—LEGISLATION. Horack's Cases. Typical federal and state statutes will be used. The history of legislation, legislative agencies, content, preparation, province and subject matter, legis-

lative drafting, means of making laws effective, mechanics, interpretation, operation, amendment, abrogation and repeal, relation of traditional law to legislation. (3) II (Matthews)

180—LABOR LAW. Landis' Cases. Case and statute law applicable to labor controversies; the trade agreement between the employer and the union; the boycott; the use of the union label on goods; federal intervention in labor disputes; and employer interference with the right to work and trade. (3) II (Stahr)

183—LANDLORD AND TENANT. Jacobs' Cases. Characteristics of leases; creation 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 (Randall)

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