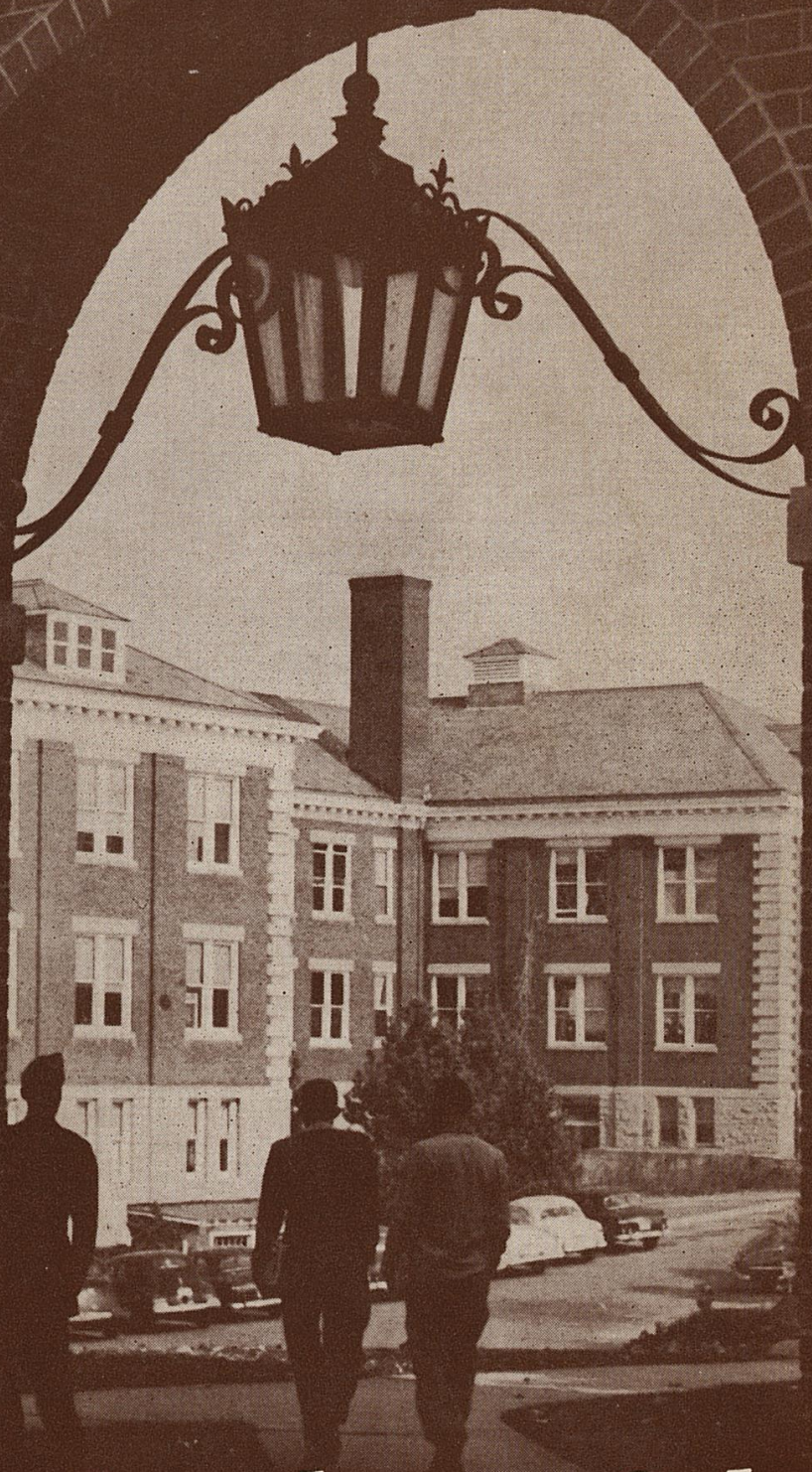
BULLETIN OF THE
UNIVERSITY OF KENTUCKY



The Graduate School

LEXINGTON, 1954

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Volume 46

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University of Kentucky

July, 1954

Graduate School

1954-55

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UNIVERSITY CALENDAR FOR THE YEAR 1954-55

First Semester

1954

Sept. 16-18	Thursday, 1:30 p.m. through Saturday, 11:00 a.m.—Clas cation of all advanced standing students and registra of all students according to an alphabetical schedule.
Sept. 20	Monday—Class work begins.
Sept. 25	Saturday—Last date one may enter an organized class the first semester.
Oct. 15, 16	Friday and Saturday—Period for filing applications for grees.
Oct. 22, 23	Graduate Record Examination.
Oct. 25	Monday—Last date one may drop a course without a gr
Dec. 18	Saturday noon—Christmas holidays begin.

1955

Jan. 3	Monday, 8:00 a.m.—Christmas holidays end.
Jan. 24-28	Monday through Friday—Final examinations.
Jan. 28	Friday, 6:00 p.m.—End of first semester.

Second Semester

Feb. 7, 8	Monday, 8:00 a.m. through Tuesday, 4:00 p.m.—Registra and classification of all students according to an al betical schedule.
Feb. 9	Wednesday—Class work begins.
Feb. 15	Tuesday—Last date one may enter an organized class the second semester.
March 4, 5	Friday and Saturday—Period for filing applications for grees.
March 11, 12	Graduate Record Examination.

March 14	Monday—Last date one may drop a course without a grade.
April 8-12	Friday, 8:00 a.m. to Tuesday, 8:00 a.m.—Easter holidays.
May 12	Thursday—Thesis deadline.
May 25	Wednesday—Latest date for reports to Graduate Office on results of final oral examinations.
May 29	Sunday—Baccalaureate services.
May 31-June 4	Tuesday through Saturday—Final examinations.
June 3	Friday—Eighty-eighth Annual Commencement.
June 4	Saturday—End of second semester.

Summer Session 1955

June 14	Tuesday, 8:00 a.m. to 4:30 p.m.—Registration and classification of all students according to an alphabetical schedule.
June 15	Wednesday—Class work begins.
June 21	Tuesday—Last date one may enter an organized class for the summer session.
June 25	Saturday—Last date one may drop a course without a grade.
June 28, 29	Tuesday and Wednesday—Period for filing applications for degrees.
July 4	Monday—Independence Day holiday.
July 23	Saturday—Thesis deadline.
August 5	Friday—Summer Session Commencement.
August 6	Saturday Noon—End of Summer Session.
Sept. 12	Monday—Opening of Fall Semester of 1955-56.

REGISTRATION SCHEDULES FOR 1954-55

First Semester

Thursday Afternoon

1:30 to 2:20 — A through Broo
2:30 to 3:20 — Bros through Cran
3:30 to 4:00 — Miscellaneous
A through Cran

Friday Forenoon

8:00 to 8:50 — Crao through Fli
9:00 to 9:50 — Flo through Haw
10:00 to 10:50 — Hax through Kei
11:00 to 11:50 — Kej through Max

Friday Afternoon

1:30 to 2:20 — May through Pes
2:30 to 3:20 — Pet through Say
3:30 to 4:00 — Miscellaneous
A through Say

Saturday Forenoon

8:00 to 8:50 — Sc through Tol
9:00 to 9:50 — Tom through Z
10:00 to 10:30 — Miscellaneous
A through Z

September 20 — Monday, 8:00 a.m. — Class work begins.

September 25 — Saturday — Last date one may enter an organized class the First Semester.

Second Semester

Monday Forenoon

8:00 to 8:50 — U through Z
9:00 to 9:50 — Sim through T
10:00 to 10:50 — R through Sil
11:00 to 11:50 — N through Q

Tuesday Forenoon

8:00 to 8:50 — H
9:00 to 9:50 — Fli through G
10:00 to 10:50 — Cro through Fle
11:00 to 11:50 — Bru through Cri

Monday Afternoon

1:30 to 2:20 — M
2:30 to 3:20 — I through L
3:30 to 4:00 — Miscellaneous
I through Z

Tuesday Afternoon

1:30 to 2:20 — A through Bro
2:30 to 3:30 — Miscellaneous
A through Z

February 9 — Wednesday, 8:00 a.m. — Class work begins.

February 15 — Tuesday — Last date one may enter an organized class for the second semester.

Summer Session 1955

Tuesday Forenoon

8:00 to 8:50 — Ke through Ni
9:00 to 9:50 — No through Si
10:00 to 10:50 — Sj through Z

Tuesday Afternoon

1:30 to 2:20 — Clo through Ge
2:30 to 3:20 — Gh through Ka
3:30 to 4:00 — Miscellaneous
A through Z

June 15 — Wednesday, 7:00 a.m. — Class work begins.

June 21 — Tuesday — Last date one may enter an organized class for the summer session.

THE GRADUATE COUNCIL AND GRADUATE FACULTY

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

HERMAN EVERETTE SPIVEY, M.A., Ph.D.
Dean of the Graduate School

MARGARET HOTCHKISS, Ph.D.
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JOHN KUIPER, Philosophy 1952-1955
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MORRIS SCHERAGO, Bacteriology 1953-1956
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PATCH GREGORY WOOLFOLK, M.S. in Agr., Ph.D. ..... Animal Husband
KENNETH RICHARD WRIGHT, M.A., Ph.D. ..... Mus

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THE GRADUATE SCHOOL

HERMAN EVERETTE SPIVEY, M.A., PH.D., Dean

INTRODUCTORY STATEMENT

Graduate work is offered in all colleges in the University. Approximately a thousand courses acceptable for graduate credit are listed in the catalogue, under the various departments. Directors of graduate study in the various subjects are listed in this bulletin just before the list of courses.

The following advanced degrees are conferred by the University:

Master of Arts
Master of Science
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 Library Science
Master of Science in Mechanical Engineering
Master of Science in Metallurgical Engineering
Master of Science in Mining Engineering
Master of Science in Public Health
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
Master of Business Administration
Master of Music
Doctor of Education (Ed.D.)
Doctor of Engineering (Engr.D.)
Doctor of Philosophy

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

ADMISSION

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

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

It may be necessary for him to satisfy certain prerequisites which he omitt in his undergraduate curriculum. These will be determined by the departm in which the major work is to be done. In brief, it may be stated that a gr uate student may begin a full program in the fields in which he has the equi lent of a balanced undergraduate major; in some cases the equivalent of undergraduate minor is adequate.

Admission to the Graduate School by the Registrar entitles a student to t such courses as he or she desires, provided the necessary preparatory cour have been taken. *However, admission does not automatically make a stud an applicant for a graduate degree.*

The Graduate Record Examination

All students working for graduate degrees should take three parts of Graduate Record Examination (the Area Tests, the Aptitude Test, and Advanced Test in the major subject). This should be done during the first te of graduate work. (See the calendar at the front of this catalogue.)

Application for Full Graduate Standing and the Graduate Record Examination

Graduate students desiring to earn a graduate degree must be approved degree-applicants by the departments in which they intend to major and by t Graduate School. This application should be made as soon as scores on Graduate Record Examinations are available and in any case prior to the beg ning of the semester or term in which the degree is sought. The appropri forms are available at the Graduate Office.

To be admitted as an applicant for a graduate degree a student must h met the following requirements: (1) an average of at least 2.5 (midway tween B and C) on a scale of 4.0 on all previous college work; (2) a satisf tory grade (in the opinion of the department concerned) on three parts of Graduate Record Examination (the Area Tests, the Aptitude Test, and Advanced Test, if there is one, suitable to the student's major); and (3) a average or better on all the graduate work completed at the University of K tucky. A student not having a 2.5 average on all previous college work may admitted as an applicant for a degree provided: (1) his performance on Graduate Record Examination, in the opinion of the major area and the De of the Graduate School, is sufficiently high; or (2) in the judgment of the ma area and the Dean of the Graduate School, he has demonstrated his com tence in graduate work. (The Graduate Record Examination may be tak either before admission or during the first semester after admission. See calendar at the front of this bulletin for the dates.)

Graduate work taken before students are admitted as "applicants for grees" will be evaluated by the major area and the Graduate School at the t the degree-application is considered, and the remaining requirements for degree will be indicated, insofar as is feasible.

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

Attendance in the Graduate School at the University of Kentucky is no right. It is a privilege which the student concedes may be withdrawn by University or any area of graduate study if it is deemed necessary by the De of the Graduate School in order to safeguard the University's ideals of scho ship and character.

Graduating Seniors as Part-Time Graduate Students

Seniors of the University of Kentucky lacking no more than six seme

hours for graduation and having an undergraduate average of at least 2.5 may register in the Graduate School with the consent of their college deans and the Dean of the Graduate School. Approval of the appropriate director of graduate study is required if the students are to be applicants for degrees. The total load of such a student shall not exceed twelve credits. The graduate residence assigned shall be one and one-half weeks for each semester hour of graduate work beyond the six or less credits needed to complete undergraduate requirements. The incidental fee shall be that of a full-time student in the school in which more than half of the work is taken. In cases where the load is evenly divided between the schools, the larger fee, if any, shall be assessed. Requirements for the undergraduate degree must be completed during the semester in which the student is allowed to register for part-time graduate work. Students desiring to do this should fill out in duplicate a petition requesting such and listing the course or courses to be taken to complete undergraduate requirements. Such a petition must be approved by both deans concerned.

GENERAL REQUIREMENTS FOR ALL ADVANCED DEGREES

Courses, Grades, and the Mark "I" (Incomplete)

All courses listed in the Graduate School Bulletin (both those numbered 100 to 199 and those numbered 200 and above) may be counted as credit toward a graduate degree provided they are approved as an appropriate part of the student's graduate program by his graduate adviser or committee. A course completed with a grade of D will not be given graduate credit. An overall average of B on all work taken as a graduate student must be attained before an advanced degree may be awarded. An "incomplete" (I) must be converted within one calendar year after the close of the term in which the I is assigned.

Registration and Classification

Before registering each semester a graduate student should confer with the director of graduate study in his major subject. (Directors of graduate study are listed just ahead of the catalogue of courses in this Bulletin.) If convenient, this conference should come in advance of the day of registration and classification; in any case it must come prior to the completion of classification and the beginning of classes. For all regular graduate students the Graduate Office will require for each registration the signature of the director of graduate study indicating approval of the proposed program.

Student Loads and Short Courses

The normal load of a graduate student during any semester is twelve semester hours if he is working for a master's degree under Plan A, or if he is working for a doctor's degree. In no case may this load for a semester exceed fifteen semester hours. In the summer session the normal load is six hours and the maximum nine. Graduate students serving in the University as assistants or part-time instructors should register for less than the normal load, as determined by their advisers. Persons holding full-time working or professional assignments, whether employed by the University or not, may not take for graduate credit toward a degree in any single semester or term more than 3 or 4 credits. Two short courses of 4 weeks or less may not be taken simultaneously. A short course may not carry credit greater than the number of weeks it is offered.

Residence

A load for full-time residence comprises a minimum of 9 semester hours graduate course work, or the equivalent in thesis research. In the summer s sion the corresponding load is 6 semester hours. Part-time residence during a semester is compused on the basis of one and one-half weeks of residence each semester hour earned. Part-time students in the summer session rece one and one-half weeks per semester hour except for short courses of less th eight weeks, in which case residence shall not exceed the actual number weeks involved.

Time Limit for Degrees

No course or residence credit is given for graduate study completed m than eight years prior to the date of the commencement at which the stud expects to take his degree unless such credit or residence is specifically valida by the Graduate Council on written recommendation of the director of gr uate study. No course or residence credit may be validated in this manner completed more than twelve years prior to the commencement date. (This r is applicable to new students registering after February, 1952, and to all oth students after June, 1955.)

Proficiency in English

No student shall be approved for a graduate degree until he has dem strated his ability to write accurate and effective English. A decision on t matter shall be based on the student's rating on the Graduate Record or equi lent examination and such other evidence as the director of graduate study special committee and Graduate Council shall deem necessary.

Graduation

Advanced degrees may be conferred at any commencement convocati but at no other time. *Attendance at the commencement at which the candid is scheduled to receive a degree is required unless the candidate is excused writing by the Dean of the Graduate School.* Appropriate academic costu must be worn. The graduation fee covers the cost of the diploma, the ho and, in the case of the master's degree (with thesis), the binding of the the

Students intending to graduate at a given commencement must make for application (at the Registrar's Office) for the degree early in the semester term of the commencement—in no case later than four weeks before graduati

Fees

Registration fees per semester are $65.00 for residents of Kentucky; $125 for non-residents. Part-time graduate students who are legal residents of state pay $7.50 per semester hour; non-residents pay $14.00 per semester h Students carrying full loads in the summer session pay one-half the regu semester fee. Those taking less than full loads pay the regular semester cre hour fee.

Graduate students holding University fellowships and scholarships, gradu assistants, and instructors pay the fees assigned to Kentucky residents.

GENERAL REQUIREMENTS FOR ALL MASTERS' DEGREES

(See also pages 11-14.)

Transfer of Credits

With the approval of his graduate adviser, the dean, and the registra student may transfer up to six credits (but no residence) toward the satis

tion of the minimum requirements for masters' degrees. In such cases the student submits with his request (endorsed by his graduate adviser) a transcript showing the courses involved.

Extension and Correspondence Work

Under certain conditions, up to six of the credits and nine weeks of the residence required for any master's degree in course may be satisfied by extension courses given in person by University of Kentucky instructors. (Students who registered before Feb., 1952, may count up to one-third of the requirements.) No graduate credit is given for courses taken by correspondence.

M.A. or M.S. Degree

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

Courses and Curricula

All courses listed in the Graduate School Bulletin are open to graduate students if approved by their directors of graduate study.

Graduate students are eligible to take (1) regular courses which meet as organized classes and (2) independent-study or research courses in which each student carries on investigations independent of class meetings; but at least one-half, and preferably three-fourths, of the minimum requirements for the master's degree shall be in regular courses.

All candidates for masters' degrees shall earn at least nine semester hours in courses numbered 200 or above. Exceptions to this rule may be made only with the approval of the Graduate Council.

Sustained Residence Required

Candidates for masters' degrees shall spend at least two full summer terms or one semester in full-time study at the University, except in rare individual cases where specific permission to modify this regulation is obtained from the Graduate Council.

Examinations

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

Application for the Degree

Early in the final semester or term the student must make formal application in the Registrar's Office for his degree.

Fees

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

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

The Two Plans

The Graduate School authorizes all departments which are approved graduate work and which wish to do so to permit students to satisfy the quirements for the M.A. and the M.S. degrees by either of two plans. T option rests with the department.

PLAN A

(See also pages 14-15.)

Credits and Courses

The candidate must complete at least 24 semester hours of graduate co work with a standing of 3.0 ("B") or better. At least 9 of these hours (exc when excused in rare individual cases by special permission of the Grad Council) must be in courses limited to graduate students (in courses numbe "200" or above).

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

Residence

The minimum residence required is one academic year of 36 weeks. T residence may be fulfilled by any combination of semesters or summer sessi which totals the required number of weeks, provided at least one full seme or two complete summer terms are spent in residence.

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

Thesis

Two typewritten, unbound copies of the thesis, approved by the th director and the appropriate director of graduate study, and in a form acce able to the Graduate School, must be presented to the Graduate School Of not later than two weeks before the last day on which grades may be repor to the Registrar's Office. The candidate must also submit an abstract of thesis not exceeding two hundred words and suitable for publication. The fi oral examination may not be taken before the thesis has been accepted by Graduate School Office. Information about this thesis deadline may be tained from the Graduate School Office.

Theses and dissertations must be developed under the direction of a m ber of the Graduate Faculty.

Each thesis or dissertation is to be judged by the final committee on merits as presented to it at the examination.

Collaborative group effort by two or more graduate students is not forb den; but there must be enough independent effort to enable each one to m a separate contribution and to prepare an individual thesis or dissertation.

Masters' theses must have the signed approval of the thesis director and appropriate director of graduate study before they may be accepted by Graduate School.

The University protects the rights of thesis and dissertation authors by pl ing certain restrictions upon borrowers' use of them as long as they are unp lished. Before the title-page of every thesis and dissertation a copy of

following *Rules for the Use of Theses* is placed. The student prepares this page for each copy of his thesis and submits it as part of the thesis.

RULES FOR THE USE OF THESES

Unpublished theses submitted for the masters' and doctors' degrees and deposited in the University of Kentucky Library are as a rule open for inspection, but are to be used only with due regard to the rights of the authors. Bibliographical references may be noted, but quotations or summaries of parts may be published only with the permission of the authors, and if granted, proper credit must be given in subsequent written or published work.

Extensive copying or publication of the thesis in whole or in part requires also the consent of the Dean of the Graduate School of the University of Kentucky.

A library which borrows this thesis for use by its patrons is expected to secure the signature of each user.

This thesis has been used by the following persons, whose signatures attest their acceptance of the above restrictions.

Name and Address	Date
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Language Requirements

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

PLAN B

Plan B (which is not necessarily available in all departments that have Plan A) has the same minimum requirements as Plan A except that six or more semester hours of course work may be substituted for a thesis and that in a few departments a reading knowledge of a foreign language may not be required. A student may follow this plan only with the approval of the department concerned. Additional requirements, if any, set up by an area of study may be found in the area announcements in the Graduate School Bulletin.

REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN EDUCATION

See Education, pages 91-92, and General Requirements for all advanced degrees, pages 14-15.

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN AGRICULTURE AND MASTER OF SCIENCE IN HOME ECONOMICS

(See also pages 13-14.)

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

1. The completion of 24 semester hours of graduate work with an aver standing of 3.0 or better, 36 weeks in residence, and a thesis, or at option of the major professor, the completion of 36 semester hours graduate work with a standing of 3.0 or better, 45 weeks in residen and no thesis requirement. At least 9 hours must be on the "200" le
2. Under either plan no grade below C may be counted.
3. One-half of the work must be in one department, the remainder in other department or departments approved by the major professor.
4. There is no language requirement for either of these professional grees.

In either case a final oral examination is given the candidate not later t 8 days before the close of the semester in which the degree is to be secu The candidate is expected to show a comprehensive knowledge of the sub matter related to the field of his major work and in case a thesis has been pared to defend it.

REQUIREMENTS FOR THE DEGREE MASTER OF MUSIC

(See page 65.)

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN PUBLIC HEA

(See also pages 13-14.)

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

1. Twenty-four semester hours in graduate courses with an average sta ing of 3.0 or better.
2. No grade below C may be counted.
3. Thirty-six weeks in residence.
4. An acceptable thesis.
5. There is no language requirement for this degree.

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN LIBRARY SCIE

(See also pages 13-14.)

Students holding a bachelor's degree from a fully accredited institution obtain the degree of Master of Science in Library Science by satisfying following requirements:

1. Nine hours of prerequsite work in library science.
2. Thirty semester hours in graduate courses.
3. An average standing of 3.0 or better on all work taken as a grad student.
4. Thirty-six weeks in residence.
5. At least one year of college credit (six semester hours with a grad C or better) in a modern foreign language or a reading knowledge demonstrated by the usual graduate examination.

REQUIREMENTS FOR ADVANCED DEGREES IN ENGINEERING

(See also pages 13-14.)

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 3.0 or better.
2. No grade below C may be counted.
3. Thirty-six weeks in residence.
4. An acceptable thesis.
5. Two-thirds of the work must be in the major subject.
6. There is no language requirement for these degrees.

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

The Professional Degrees in Engineering

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

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

An application for a professional degree must be made to the Dean of the Graduate School and have the approval of the director of graduate study in the applicant's engineering field not less than one academic year before the degree may be granted.

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

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

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

Fees

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

REQUIREMENTS FOR THE DOCTOR OF ENGINEERING DEGREE

(These are the same as those for the Ph.D. degree.)

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

(See also pages 13-14 of this bulletin.)

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

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

Admission

For information concerning admission see pages 11-12.

Advisers and the Special Committee

The director of graduate study in the student's major area will be the dent's adviser until he has selected his dissertation director and has b accepted by him. When the dissertation director has been chosen, the stude Special Committee will be set up by the dean after he has conferred with student, the director of graduate study, and the dissertation director. This c mittee should be set up as soon as the student has adjusted himself to the versity environment and has found a suitable dissertation problem. Until Special Committee is formed, the director of graduate study will advise the plicant as to his schedule of study, and he must initial each schedule befor is presented to the Dean.

The Special Committee will consist of the dissertation director as chairm two or three other members from the major area, and one or two meml from the minor academic area—in all, five members. This committee will vise the applicant and will set the requirements which the student must before he will be admitted to the final examination.

The Special Committee keeps minutes of all meetings and sends abbrevi copies to the Dean's Office to be made a part of the student's record. This C mittee determines when the qualifying examination is to be administered, the chairman schedules the examination in writing, sending a copy of the nouncement to the dean. The appointed Special Committee will be the judge on a majority basis of the questions to be asked on the qualifying ex nation and of the result of the examination. This committee may be adv by colleagues when it thinks advice is desirable.

Courses of Study and Student Loads

Every applicant for the degree must select one major area of study and more than two minor subjects, at least one of which must be outside the m

area. The major subject shall be one in which he intends to concentrate his efforts; the minor subjects must be approved by the major area and by the representative of the minor on the Special Committee.

The applicant's principal work must be in the major subject. Although the regulations are somewhat elastic respecting the time to be devoted to the major and minor subjects, the major subject should represent approximately two-thirds of the student's entire time. The other one-third should be devoted to the minor subject(s). At least one-sixth of the total time must be devoted to a minor outside of the major academic department, and at least one member of the Special Committee from outside the major area must represent this outside minor. Only the Graduate Council may authorize departures from this rule.

A full-time course load for any semester ranges from 9 to 15 semester hours of credit; in the summer, from 6 to 9 semester hours.

Residence

A minimum of three collegiate years of resident graduate work, of which at least the last required year in residence must be spent at the University of Kentucky, is required for the doctorate. The amount of residence to be transferred on account of prior graduate work at some other institution is determined jointly by the Special Committee, the Registrar, and the Dean of the Graduate School. Candidates may be given leaves of absence by their Special Committees (not to exceed one-fourth of the last year of required residence) to make use of superior facilities elsewhere. Leaves consuming more than one-fourth of the last year must be approved by the Graduate Council and will not be allowed to candidates who have not spent already at least one year at the University.

A doctoral student's schedule may include an assignment to work on his dissertation, and appropriate residence may be allowed for such research, but in no case shall the residence allowed exceed the number of weeks spent in such dissertation research.

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

Language Requirements

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

Qualifying Examinations

A qualifying examination is required of all applicants for the doctorate to determine whether the applicant should be admitted to candidacy. The examination probably should be taken during the student's fourth semester of full-time graduate study, or the equivalent, but in no case later than the thirtieth day of the academic year in which the degree is expected. This examination shall be both written and oral and shall cover both major and minor subjects.

The Special Committee shall report to the dean the result of the examinati including the time schedule of the examination. If the result is failure, committee shall recommend the conditions to be met before another exami tion may be administered. The minimum time before another examination be given is six months. The same committee, or as many of the member are available, plus those added by the dean to fill vacancies, shall give second examination. A third examination shall not be allowed.

A year of residence is required after the qualifying examination before degree is conferred. However, in rare individual cases, if a student has co pleted his full residence and course requirements and wishes to complete dissertation in absentia, he may petition the Graduate Council for permiss to do this out of residence and without payment of the usual registration fe Even if such permission is granted, at least a year must elapse between qualifying examination and the awarding of the degree.

Dissertation

Each candidate must present a dissertation covering his thesis work. T dissertation must give evidence of the candidate's ability to carry on in pendent investigation and must be satisfactory in style and composition. must represent a definite contribution to the knowledge of his subject, m be the result of independent work, must include original research, and m in some way add to or otherwise modify what was previously known on subject. Unless the director of the dissertation specifically recommends partures from the instructions in the thesis manual recommended by the Gr uate School, the thesis must be in conformity with advice in this manual. T bound typewritten copies of the dissertation and two unbound typewrit copies of an abstract, usually of not less than 400 words nor more than words, must be presented to the Dean of the Graduate School at least weeks before the final date on which the Registrar's Office will receive gra of candidates for degrees at the next commencement. An approval sh signed by a majority of the special committee (including the director of thesis) must accompany the dissertation. A standard form containing Ru *for the Use of Theses* must be prepared and must be bound with the ma script, before the title page. (See page 17 for these *Rules.*)

It is expected that every doctoral dissertation will be worthy of publicat either in its entirety in book form or as articles in the leading journals periodicals of the field, and the candidate is urged to use every reasona effort to obtain such publication for his own sake and in the interest of Graduate School. In order to insure availability of such contributions, the lowing arrangements are provided:

1. A candidate may elect in writing to have his dissertation publish either as a whole or in acceptable part (if approved by the director graduate study in the area concerned and by the Dean of the Gradu School), in a book or an approved journal. A candidate must mak deposit of $50 to guarantee publication. If within four years after commencement at which the degree was received the candidate dem strates that he has a contract with a recognized publisher or an ceptance by an editor of a recognized journal, he will be allowed more year to submit the required number of copies to the Gradu School and to recover his deposit. Failing of either step he will for his deposit and arrangement no. 2 will be followed. The printed sertation must have a cover and a title page, and the latter, in addi to the title and the name of the author, must bear an appropriate scription as follows:

A dissertation } presented
A portion of a dissertation }
to the Faculty of the Graduate School of the University of Kentucky in candidacy for the degree of Doctor of Philosophy (Education)

2. A candidate may elect in writing to let his dissertation be microfilmed and copyrighted by the University. The copyright will be taken in the name of the author. One positive microfilm copy will be deposited in the University Library and will be available for inter-library loan. Microfilm copies of dissertations may be purchased at cost. The abstract of each dissertation will be printed in an issue of *Microfilm Abstracts* (published by University Microfilms, Ann Arbor, Michigan), which is distributed to leading libraries here and abroad. University Microfilms will also have the microfilm copy of the dissertation catalogued by an expert, and this information sent to the Library of Congress, for printing and distribution of cards to depository catalogues and libraries.

   To cover the costs involved, a candidate is required to pay at the Office of the Comptroller a fee of $50 before taking the final examination. Even if the candidate elects to use this arrangement for publication he should understand that it is still desirable for him to have his work printed in a recognized way.

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, or, if the examining committee elects, an oral and a written examination. The examining committee shall consist of a minimum of five persons, appointed by the Dean of the Graduate School, after he has conferred with the director of graduate study for the area. (The President of the University and the Dean of the Graduate School are ex-officio members of all examining committees.) The director of graduate study (or his delegate) shall be chairman of the committee. Other members shall include the major professor, a third representative of the department, a representative of the minor, and one member of the Graduate Faculty associated with neither the major nor minor areas. The final examination shall include a defense of the dissertation and shall be as comprehensive in the major and minor areas as the committee desires to make it.

If the student passes this examination, he will be recommended for the degree at the next commencement provided one academic year has elapsed since the qualifying examination.

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

Recommendation for the Degree and Attendance at Commencement

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.

Attendance at commencement is required for those receiving degrees unless (for special reasons) they are excused in writing.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF EDUCATION

The requirements for the degree of Doctor of Education are 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 is required of which at least one-third a not more than one-half must be in departments outside the College Education.

Applicants for the Ed.D. degree, who are required to do at least one-th of the minimum requirements outside of areas in the College of Educati shall declare at least one area other than Education when their Special Co mittees are apointed. Two members shall be chosen from areas outside t College of Education.

The Registrar, the Graduate committee of the College of Education, a the Graduate Dean will evaluate credits and residence to be allowed trans students. It is understood, however, that the Special Committee may acc only such courses as fit into the graduate program of the student.

GRADUATE STUDENTS NOT APPLICANTS FOR DEGREES

Graduate students who are not working toward advanced degrees are r required to designate major or minor subjects, but may elect their work wit view to the special purposes for which they are in attendance at the Universi

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

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

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

CHECK LIST FOR GRADUATE STUDENTS SEEKING ADVANCED DEGREES

1. Send to the Registrar application for admission; request Registrars former institutions to send transcripts of work previously completed; a request references to send letters of recommendation—all at least f weeks prior to first admission.
2. On or before date of first registration consult appropriate director graduate study (see list in this Bulletin) and plan tentative course study. (At registration the director's signature on the classification c approving the registration is required.)
3. *Within the first week of the first term or semester apply for the Gradu Record Examination* (Area Tests, Aptitude Test, and Advanced T if available, in your major field), if you have not previously taken t standardized test. Apply at the University Testing Bureau, Person Office, Administration Building. Take test at time designated in t calendar at the front of this bulletin. (*Scores on this test are necess before admission to full graduate standing.* See page 12 of this bulleti
4. Early in the first term or semester begin preparations for the langu examination(s) required for the degree and arrange to take the nec sary language examination(s) early in graduate career.
5. *After first term or semester apply for full graduate standing* (sec forms from the Graduate Office), if a graduate degree is sought.

6. Before the beginning of each succeeding semester or term consult the appropriate director of graduate study concerning program for the new term.
7. If doctoral applicant, during or before the fourth semester of graduate study confer with director of graduate study and graduate dean concerning Special Committee. After the appointment of the Special Committee, the chairman becomes graduate adviser. At least once each year request the chairman of the Special Committee to hold a meeting to review the course program and the research, in retrospect and (especially) in prospect.
8. If doctoral applicant, arrange with Special Committee for Qualifying Examination at least one academic year before the degree is expected.
9. Before beginning thesis or dissertation, secure from the Campus Bookstore Kate Turabian's *A Manual for Writers of Dissertations* and follow instructions therein, unless specifically directed otherwise by your director of graduate study.
10. *Early in the semester or term when the degree is expected, file application for the degree* (Registrar's Office).
11. Submit to the Graduate Office the thesis (if required) or dissertation in final form (after it has been read and approved by the director of graduate study and the committee) by or before the thesis deadline indicated in the University Calendar at the front of this Bulletin.
12. Arrange for the final oral examination (consult the director of graduate study and the Graduate Office) at least two weeks before the end of the term or semester when the degree is expected.
13. Pay the commencement fee and (if applicable) the dissertation fee as soon as the final oral examination is scheduled.
14. Secure commencement instructions from the Graduate Office.

RESEARCH PROGRAM AT OAK RIDGE INSTITUTE OF NUCLEAR STUDIES

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

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

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

Southern Regional Training Program in Public Administration

Since 1945 the Universities of Kentucky, Alabama, and Tennessee have co ducted a joint program in public administration leading to a master's degr Part of the course work is completed at each institution, and three months successful internship are required. For detailed information, anyone interest should inquire of the Political Science Department at the University of Ke tucky.

Advanced Study and Research by Guests of the University

When the appropriate resources are available at the time desired, the Pre dent of the University, upon the recommendation of the Dean of the Gradu School and the department affected, will welcome advanced scholars as gue of the University, with the privilege of auditing seminars and research cour and of carrying on research in laboratories and libraries. Normally there w be no charge except for laboratory expenses. Negotiations for such arran ments should be conducted in advance through the Graduate Office.

FELLOWSHIPS AND SCHOLARSHIPS

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

> *The Margaret Voorhies Haggin Trust Fellowships and Scholarsh in Memory of Her Father, George Voorhies* University Fellowships, w a stipend of $750 each. University Scholarships, with a stipend of $6 each.

Fellows and Scholars are expected to devote their entire time to gradu work, and no teaching or other departmental work may be required of the nor are they permitted to perform any duties for extra pay. Fellows and schol must carry a full schedule unless work on a thesis is substituted for part of load. In this case recommendation must be made by the adviser and appro by the Graduate Council. The award is paid in ten equal monthly installme Fellows, scholars, graduate assistants, and instructors pay the fees assessed n dents of Kentucky. The appointments are made for one year only but may renewed if it can be shown that the study and research should be contin

These fellowships and scholarships are open to students who hold a bac lor's degree or higher from any college or university of recognized stand Forms for making applications may be secured from the office of the Dean the Graduate School and must be submitted not later than March 1 of e year.

SUBJECTS AND DIRECTORS OF GRADUATE STUDY

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

Subjects	*Directors of Graduate Study*
I. Agriculture and Home Economics	
Agricultural Education	Carsie Hammonds
Agricultural Economics	A. J. Brown
Agricultural Entomology	L. H. Townsend
Agronomy	E. N. Fergus
Animal Industry	W. P. Garrigus
Animal Nutrition (See Animal Industry)	
Animal Pathology	F. E. Hull
Dairying (See Animal Industry)	
Farm Engineering (See Agronomy)	
Forestry (See Horticulture)	
Genetics (See Animal Industry)	
Home Economics	S. E. Erikson
Home Economics Education (See Education)	
Horticulture	C. S. Waltman
Plant Pathology (See Agronomy)	
Poultry Husbandry (See Animal Industry)	
Rural Sociology	H. W. Beers
II. Arts and Sciences	
Anatomy and Physiology	R. S. Allen
Ancient Languages	J. D. Skiles
Anthropology	C. E. Snow
Art	D. L. Weismann
Bacteriology	M. S. Scherago
Botany	H. P. Riley
Chemistry	L. R. Dawson
Dramatic Arts (See English)	
Economics (See Commerce)	
English, Speech, and Dramatic Arts	W. S. Ward
French (See Modern Foreign Languages)	
Geography	J. R. Schwendeman
Geology	A. C. McFarlan
German (See Modern Foreign Languages)	
Greek (See Ancient Languages)	
Hebrew (See Ancient Languages)	
History	T. D. Clark
Hygiene and Public Health	W. A. Heinz
Journalism (At present no graduate majors are offered in this subject)	
Latin (See Ancient Languages)	
Library Science	E. J. Humeston
Mathematics and Astronomy	J. C. Eaves
Modern Foreign Languages	A. E. Bigge
Music	E. E. Stein

Philosophy ..... John Kuiper
Physical Education ..... C. W. Hackensmith
Physics ..... F. L. Yost
Political Science ..... Amry Vandenbosch
Psychology ..... J. S. Calvin
Radio Arts (At present no graduate majors are offered in this subject)
Social Work (At present no graduate majors are offered in this subject)
Sociology and Rural Sociology ..... H. W. Beers
Spanish (See Modern Foreign Languages)
Speech (See English)
Zoology ..... J. M. Carpenter

III. COMMERCE

Commerce ..... Ralph R. Pickett
Economics ..... M. R. Sullivan

IV. EDUCATION

Administration and Supervision ..... A. D. Albright
Agricultural Education ..... Carsie Hammonds
Business Education ..... V. A. Musselman
Elementary Education ..... Fred Harris
Foundations of Education ..... E. F. Hartford
Higher Education ..... F. G. Dickey
Home Economics Education ..... Ethel Parker
Music Education ..... J. W. Worrel
Secondary Education ..... Lyman V. Ginger

V. ENGINEERING

Civil Engineering ..... R. E. Shaver
Electrical Engineering ..... H. A. Romanowitz
Mechanical Engineering ..... E. B. Penrod
Metallurgical Engineering ..... C. S. Crouse
Mining Engineering ..... C. S. Crouse

VI. LAW (At present no graduate majors are offered in this subject)

VII. PHARMACY (At present no graduate majors are offered in this subject)

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; S stands for the summer session.

I. AGRICULTURE AND HOME ECONOMICS

AGRICULTURAL EDUCATION *(See Education)*

AGRICULTURAL ENTOMOLOGY

102—ECONOMIC ENTOMOLOGY. For those interested in agricultural teaching and extension work. Life history, control, and means of identification of economic insects of Kentucky are considered. Lectures, 2 hours, lab, 2 hours. *Prerequisites: Ag. Ent.* 1. (3) S (Townsend)

103—ECONOMIC ENTOMOLOGY. Fruit and garden insects. Life histories, habits, distribution, and control of insects injurious to fruits and vegetables, with attention to those found in Kentucky. The enemies of these species are considered. Lectures, 2 hours; lab, 2 hours. *Prerequisite: A. E.* 1. (3) I, S (Townsend)

104—ECONOMIC ENTOMOLOGY. Farm crop insects and animal parasites. Life histories, habits, distribution, and control of insects injurious to farm crops; also insect parasites of farm animals. Enemies of these species are considered. Lectures, 2 hours; lab, 2 hours. *Prerequisite: A. E.* 1. (3) II, S (Townsend)

105a, b—SYSTEMATIC AND TECHNICAL AGRICULTURAL ENTOMOLOGY. Insect physiology, anatomy, ecology, and taxonomy, entomological literature and technique; studies of special groups of insects. *Prerequisites: A. E.* 1, *and any one of the following:* 102, 103, 104. (3) I, II (Townsend)

201a, b—ENTOMOLOGICAL PROBLEMS. Investigations of chosen insect problems, including original work. Discussion and assignment of current insect subjects. *Prerequisites: A. E.* 1, 103, 104, *and* 105*a, b.* (3) I, II (Price)

AGRICULTURAL EXTENSION

101—METHODS OF EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS. History, philosophy and development of Extension Work. Legislative background, organizing forces, administration, financing, program building, leader training, relationships, 4-H clubs. Lecture, 3 hours. (3) II (Bryant)

AGRONOMY

Courses in Crops

101—PASTURE PRODUCTION AND MANAGEMENT. The selection of pasture crops and their establishment, fertilization, and management for temporary or permanent pastures. Lecture and recitation, 3 hours. *Prerequisite: Agron.* 1. (3) I, S (Sigafus)

102—FIELD CROP ECOLOGY. A study of the environmental factors affecting the yield and quality of field crops. Lectures and recitation, 3 hours. *Prerequisites: Agron.* 1; *Bot.* 1. (3) I (Sigafus)

103—WEEDS. The important characteristics, identification, and control of weeds, with emphasis on identification and control of Kentucky weeds. *Prerequisite: Bot.* 1. (2) II, S (Sigafus)

104—ADVANCED CROPS: FORAGE CROPS. A comprehensive study of forage crops with special emphasis upon their production in Kentucky. Lectures, 3 hours. *Prerequisites: Agron.* 1; *Bot.* 1. (3) I (Fergus)

105—ADVANCED CROPS: CEREALS. Important cereal crops are studied as regards distribution, soil, and climatic adaptation, and technique of production. Lectures and recitation, 2 hours. *Prerequisites: Agron.* 1; *Bot.* 1. (3) II (Sigafus)

106—FIELD CROP IMPROVEMENT. A study of the principles involved and the technique used in breeding crop plants. Lectures, 3 hours. *Prerequisites: Bot.* 1; *Agron.* 1; *A. I.* 61. (3) II

107—ADVANCED CROPS: TOBACCO. Growth characteristics, types, genetics, physiology, and culture of tobacco including selection of land, rotations, plant bed management, fertilization, field care, harvesting and curing with special emphasis on burley. Lecture and discussion, 2 hours; laboratory or field, 2 hours. *Prerequisites: Bot.* 1; *Agron.* 1. (3) II (Diachun)

109a-c—SPECIAL PROBLEMS IN CROPS. Intensive studies of specific crop pro lems. *Prerequisites: Aron. 1 and approval of instructor.* (3 ea.) I, II, S (Staff)

200a-d—AGRONOMY SEMINAR. (1 ea.) I, II (Staff)

204a-d—SPECIAL PROBLEMS IN PRODUCTION OF FORAGE CROPS. Intensi studies of research relative to particular problems in forage crop production. *Prerequisi approval of instructor.* (3 ea.) II, S (Fergus, Sigafus)

205a, b—SPECIAL PROBLEMS IN PRODUCTION OF TOBACCO OR CEREAL *Prerequisite: approval of instructor.* (3) II, S (Staff)

Courses in Soils

110—SOIL BIOLOGY. A study of soil organisms and biological soil processes in lation to soil productivity. Lecture, 2 hours; lab, 2 hours. *Prerequisites: Agron.* 10; Bi 52. (3) I (Seay)

111—SOIL CONSERVATION. The scope and nature of the soil conservation proble and the application of soil conservation methods to the planning and management of farm Lecture and recitation, 2 hours; lab, 2 hours. *Prerequisite: Agron.* 10. (3) I, II, S (Survant)

112a-d—SPECIAL PROBLEMS IN SOILS. Intensive studies of specific soil problem *Prerequisites: Agron.* 10 *and approval of instructor.* (3) I, II, S (Karraker, Survant, and Seay)

114—FERTILIZERS AND SOIL FERTILITY. Sources, manufacture, evaluation, a use of fertilizers and lime materials; soil organic matter and nitrogen. Lecture and reci tion, 3 hours. *Prerequisite: Agron.* 10. (3) II (Karraker)

119—SOIL ORIGIN, CLASSIFICATION AND MAPPING. A study of the orig nature, classification, and mapping of soils. Lecture, recitation, and field work, 3 hou *Prerequisite: Agron.* 10. (3) II (Karraker)

120—SOIL PHYSICS. Physical properties of soils, their relationships to managem and conservation. Lecture and discussion, 2 hours; lab, 4 hours. For Agronomy majors a others having a special interest in soils. *Prerequisites: Agron.* 10 *and approval of instruct* (4) II (Survant)

200a-d—AGRONOMY SEMINAR. (1) I, II (Staff)

212a-d—RESEARCH IN SOILS. *Prerequisite: approval of instructors.* (3) I, II, S (Karraker, Seay, Survant)

Courses in Plant Pathology

123a-c—SPECIAL PROBLEMS IN PLANT PATHOLOGY. *Prerequisite: Agron.* (3 ea.) I, II, S (Diachun, Valleau)

141—PLANT PATHOLOGY. Significance, nature, causes and methods of control plant diseases. *Prerequisite: Bot.* 1. (3) II (Diachun)

142—DISEASES OF PLANTS. Symptoms, causes, and control of some of the m common representative plant diseases. Students may specialize on disease problems in th major field of interest. *Prerequisites: Agron.* 141 *or equivalent and consent of instruct* (3) II (Staff)

200a-d—AGRONOMY SEMINAR. (1) I, II (Staff)

241—VIRUS DISEASES OF PLANTS. Characteristics and properties of viruses t cause plant diseases; host-virus relationships; identification and control of some import virus diseases; consideration of research methods. *Prerequisites: Agron.* 141 *or equivale and consent of instructor.* (4) II (Diachun)

245a-d—RESEARCH IN PLANT PATHOLOGY. *Prerequisites: Agron.* 141 *or equi lent and consent of instructor.* (3) I, II, S (Staff)

Farm Engineering

101a-c—SPECIAL PROBLEMS. This course is designed to permit advanced stude to make an intensive study of some phases of agricultural engineering in which they particularly interested. *Prerequisite: approval of instructor.* (2) I, II, S (Staff)

102—DAIRY ENGINEERING. Engineering principles involved in the constructi operation, and management of machinery and equipment used in processing dairy produ Lecture, 2 hours. *Prerequisite: Fm. Engr.* 1. (2) II (Kelley)

104—RURAL ELECTRIFICATION. Designed to give students information on h to obtain electric service and on the problems involved in selecting and using farm home electrical equipment. Lecture, 2 hours. (2) I, II (Kelley)

105—ENGINEERING PRACTICES IN WATER MANAGEMENT. Surveying, m ping, and determining areas of farm land; designing farm drainage systems; farm reservo controlling water erosion with terraces and other mechanical structures. Lecture, 1 ho lab, 4 hours. (3) I, II, S (Kelley and Brooks)

106—ADVANCED FARM MACHINERY. Selection, operation and maintenance of farm machinery with emphasis on power-driven machines. Analysis of the machinery needs of farms, adjustments and servicing of machines. Lecture, 1 hour; lab, 4 hours. (3) S (Young)

107—ADVANCED FARM STRUCTURES. Planning buildings for the adequate housing of farm animals, crops, machinery and supplies. Design problems considering the efficient use of labor, space requirements, construction methods, use of various building materials and costs. *Prerequisites: F. E. 3 and consent of instructor.* (3) S (Brooks)

108—RURAL HOUSING. Factors involved in selection of building site, landscaping, functional house planning, designing and selection, and use of materials, electrical, plumbing, lighting and heating equipment and installation; preparation of specifications; estimating of costs; financing; construction; contracts; insurance and liens. Study of prefabricated houses will be included. *Prerequisites: H. Econ. 61 or equivalent and consent of instructor.* (2) S (1954) (Kelley, Ida C. Hagaman, other college instructors and business representatives.)

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. *Prerequisites: A. I. 1 and 61.* (3) II (Steele)

102—ADVANCED LIVESTOCK JUDGING. Primarily for judging team candidates. Open only to those who have made good standings in the prerequisite courses. Lab, 6 hours. *Prerequisites: A. I. 1, 2 and approval of instructor.* (3) I (Long)

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; lab, 2 hours. *Prerequisite: A. I. 81.* (3) (Horlacher)

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; lab, 2 hours. *Prerequisites: A. I. 1. and 81.* (3) II (Woolfolk)

105—BEEF PRODUCTION. History and importance of the beef cattle industry; selection, breeding, feeding and management of beef cattle. Lecture, 2 hours; lab, 2 hours. *Prerequisites: A. I. 1 and 81.* (3) II (Long)

106—PORK PRODUCTION. History and importance of the swine industry; selection, breeding, feeding, and management of swine. Lecture, 2 hours; lab, 2 hours. *Prerequisites: A. I. 1 and 81.* (3) I, II (Barnhart)

108—MEAT JUDGING. Intensive instruction in the evaluation of carcasses and cuts of beef, veal, pork, and lamb. Lab, 4 hours. *Prerequisite: A. I. 6 or A. I. 7.* (2) I (Kemp)

109a-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 (Kemp)

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 (Woolfolk)

205a-c—RESEARCH IN BEEF CATTLE HUSBANDRY. Problems involving original investigation. (3) I, II, S (Garrigus and Long)

206a-c—RESEARCH IN SWINE HUSBANDRY. Problems involving original investigation. (3) I, II, S (Barnhart)

500-1, 2, 3—THESIS. (0) (Staff)

Courses in Dairying

120—DAIRY CATTLE BREEDING. Application of genetics to problems of breed and herd improvement; progeny testing of sires; type classification, selective registration; prominent families and strains within the leading dairy breeds. Lecture, 2 hours; lab, 2 hours. *Prerequisite: A. I. 61.* (3) II (Seath)

121—DAIRY CATTLE FEEDING AND MANAGEMENT. Application of principles of nutrition to dairy cattle feeding; current methods contributing to maximum efficiency in the production of quality dairy products on the farm. Lecture, 2 hours; lab, 2 hours. *Prerequisite: A. I. 81.* (3) I (Seath and Lassiter)

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 lab. *Prerequisites: A. I. 21 and 23.* (3) I (Seath)

123—DAIRY BACTERIOLOGY. Application of bacteriological principles to the p duction and processing of dairy products, entrance of micro-organisms into dairy produ effects of their growth and methods for control. Lectures, 2 hours. *Prerequisite: Bact. or* 102. (2) I (Morrison)

124—DAIRY BACTERIOLOGY LABORATORY. Laboratory to accompany A. I. 1 Dairy Bacteriology. Lab, 4 hours. *Prerequisite or concurrent: A. I.* 123. (2) I (Morrison)

125—BUTTER AND ICE CREAM. The principles involved in the commercial ma facture, handling, and storage of butter and ice cream. Lecture, 3 hours; lab, 6 ho *Prerequisite: A. I.* 21. (5) I (Barkman)

127—SURVEY OF DAIRY INDUSTRY. Same as A. I. 27 except that graduate s dents will be given additional assignments. (3) S (Staff)

128—TECHNICAL CONTROL OF DAIRY PRODUCTS. Various chemical and b teriological tests used in the control of production or processing of dairy products. Lab recitation, 6 hours. Offered 1952-53 and alternate years. *Prerequisites: A. I.* 21, 1 *and* 124. (3) II (Morrison and Freeman)

129a-f—SPECIAL PROBLEMS IN DAIRYING. Approval of instructor required. (3) I, II, S (Dairy Staff)

130—MARKET MILK. A study of problems concerning the production and proces of market milk and its related products. Lecture, 2 hours; lab, 3 hours. *Prerequi A. I.* 21. (3) II (Morrison)

131—CHEESE-MAKING. A study of problems and practices in the manufacture ripening of cheddar and other common types of cheese. Lecture, 2 hours; lab, 3 ho *Prerequisite: A. I.* 21. (3) II (Freeman)

132—REPRODUCTION IN DAIRY CATTLE. A study of male and female reprod tive processes in dairy cattle and the application of artificial breeding to the improvemen dairy herds. Lecture, 1 hour; lab, 2 hours. *Prerequisite: A. I.* 21, 61 *and Zool.* 1. (2) II (Perkins)

133—ADVANCED DAIRY PRODUCTS JUDGING. Same as A. I. 33 except graduate students will be given additional assignments. Lecture, 1 hour; lab, 2 ho *Prerequisite: A. I.* 22 *or approval of instructor.* Offered in 1943-54 and alternate years. (2) II (Freeman)

139a-d—DAIRY SEMINAR. Open to seniors and graduate students. (1) II (Dairy Staff)

221a-c—RESEARCH IN DAIRYING. Problems involving original investigation either dairy production or dairy manufacturing. (3) I, II, S (Dairy Staff)

222—CURRENT DEVELOPMENTS IN DAIRY SCIENCE. A course designed acquaint the advanced student with the more significant problems and scientific deve ments of current interest in the dairy field. Lecture, 3 hours. (3) II or S (Staff)

See also A. I. 200, Animal Industry Seminar.

500-1, 2, 3—THESIS. (0) (Staff)

Courses in Poultry Husbandry

140—POULTRY BREEDING. Genetic principles involved in poultry breeding; dis resistance; inheritance of egg production and related characters; development of bree programs. Lecture, 3 hours. *Prerequisites: A. I.* 41 *and* 61. (3) I (Wightman)

141—ADVANCED POULTRY PRODUCTION. Studies of control measures in po diseases, nutrition, marketing; flock management and replacement. Lecture, 2 hours; and dem,, 2 hours. *Prerequisite: A. I.* 41. (3) I (Wightman)

142—MARKETING AND PROCESSING POULTRY PRODUCTS. Organization functioning of markets; grading, packaging, and handling poultry and eggs. Lectur hour; lab, 2 hours. *Prerequisites: A. I.* 41; *and Ag. Econ.* 100. *Same course as Ag. E* 109. (2) I (Wightman and Roberts)

145—ADVANCED POULTRY JUDGING. Primarily for judging team candid Open only to those who have made good standings in the prerequisite courses. Lectur hour; lab, 4 hours. *Prerequisites: A. I.* 41 *and* 44. (3) I (Wightman)

146—A SURVEY OF THE POULTRY INDUSTRY. Same as A. I. 46 except graduate students will be given additional assignments. (3) S (Staff)

149a-c—SPECIAL PROBLEMS IN POULTRY. *Prerequisite: permission of instru* (3) I, II, S (Wightman)

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

See also A. I. 200, Animal Industry Seminar.

500-1, 2, 3—THESIS. (0) (Staf

Courses in Genetics

161—GENETICS. Lectures of A. I. 61 and assigned readings. Primarily for grad students. Lecture, 3 hours. *Prerequisite: one course in biology.* (3) I, II, S (Steel

162—GENETICS LABORATORY. Similar to A. I. 62 but additional work required. Primarily for graduate students. Lab, 2 hours. Concurrently with A. I. 161, at student's option. (1) I, II, S (Steele)

163—ADVANCED GENETICS. Concerned chiefly with the physical basis of heredity, mutations, chromosomal aberrations, linkage, genetics and development, and reports on current literature. Lecture, 3 hours. *Prerequisite: A. I.* 61. (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.

500-1, 2, 3—THESIS. (0) (Steele)

Courses in Animal Nutrition

281—ANIMAL NUTRITION. The chemistry and physiology of animal nutrition and the nutritive requirements for growth, fattening, reproduction, lactation and other body functions. Lecture, 3 hours. *Prerequisite: Chem.* 37 *or equivalent.* (3) I (Thompson)

282—LABORATORY METHODS IN ANIMAL NUTRITION. The use of laboratory techniques and equipment in the solution of fundamental problems of nutrition. Lecture and recitation, 1 hour; laboratory, 6 hours. *Prerequisite or concurrent: A. I.* 281. (4) I (Grainger)

283—ADVANCED ANIMAL NUTRITION. History and development of nutritional theories and techniques; a critical review of current literature. Lecture and recitation, 3 hours. *Prerequisite: A. I.* 281. (3) II (Thompson)

See also A. I. 200, Animal Industry Seminar.

284a-c—RESEARCH IN ANIMAL NUTRITION. Problems involving original investigation. (3) I, II, S (Thompson, Grainger)

289a-c—SPECIAL PROBLEMS IN ANIMAL NUTRITION. Approval of instructor required. (3) I, II, S (Thompson,Grainger)

500-1, 2, 3—THESIS. (0) (Thompson, Grainger)

ANIMAL PATHOLOGY

101—ANATOMY AND PHYSIOLOGY OF DOMESTIC ANIMALS. A study of anatomy and physiology as related to courses in livestock judging, nutrition, butchering, breeding, and infectious diseases. Lectures, 3 hours. (3) I (Brown)

102—INFECTIOUS DISEASES OF DOMESTIC ANIMALS. Distribution, general nature, manner of dissemination, method of control, prevention and eradication of infectious and parasitic diseases of animals. Lecture, 3 hours. *Prerequisite: A. P.* 51. (3) II (Hull, Brown)

104a, b—SPECIAL PROBLEMS IN ANIMAL PATHOLOGY, *Prerequisites: A. P.* 51, 101, *and* 102, *and approval of instructor.* (3) I, II (Hull, Brown)

201a, b—INVESTIGATIONS IN ANIMAL DISEASES. This course is open only to persons who have a degree in veterinary medicine. (3) I, II (Hull, Brown)

AGRICULTURAL ECONOMICS

Economic and Social Aspects of Agriculture

Courses are offered in the fields of agricultural economics and of rural sociology leading to the degrees of Master of Science, Master of Science in Agriculture, and Doctor of Philosophy. Courses in the Department of Agricultural Economics and the Department of Rural Sociology will be included in the major requirements for these degrees with consent of the major adviser.

Economic Aspects of Agriculture

Courses are offered in the field of agricultural economics leading to the degrees of Master of Science, Master of Science in Agriculture and Doctor of Philosophy. Courses in the Department of Agricultural Economics will be in-

cluded in the major requirements for these degrees with consent of the maj adviser.

Agricultural Marketing

100—AGRICULTURAL MARKETING. Principles and methods of marketing fa products with attention to systems and agencies at both country and central mark *Prerequisites: Econ.* 51 *and Agr. Econ.* 1. (3) I, II (Binkley, Vennes)

101—AGRICULTURAL COOPERATION. Principles, methods, and problems involv in the cooperative marketing of farm products and in the purchase of farm product supplies through cooperatives. *Prerequisite: Agr. Econ.* 100. (3) II (Vennes)

102a—MARKETING TOBACCO. Special emphasis on the marketing of and the m ket system for tobacco. Application of marketing principles and methods to tobacco. P *requisite: Agr. Econ.* 100. (2) I, S (Clark, C. M.)

102b—TOBACCO MARKET GRADES AND GRADING. Procedures and proble in establishing market standards for tobacco, including practice in grading. *Prerequisite concurrent: Agr. Econ.* 102a, *or approval of instructor.* (1) S (Clark, C. M.)

103—MARKETING LIVESTOCK AND LIVESTOCK PRODUCTS. Analysis of li stock and dairy markets; market organization, agencies, institutions, and services; and pu lic regulations. *Prerequisites Agr. Econ.* 100. (2) II (Brown)

109—MARKETING AND PROCESSING POULTRY PRODUCTS. Organization a operation of markets; grading, packaging and handling poultry and eggs. Lecture, 1 ho lab, 2 hours. *Prerequisites: A. I.* 41 *and Agr. Econ.* 100. Same course as Animal Indus 142. (2) I, S (Roberts and Wightman)

206—ADVANCED AGRICULTURAL MARKETING. A critical examination of me ods, objectives, and results of various types of research in market organization, market functions, market management, and price analysis. *Prerequisite: approval of instructor.* (3) I (Price)

Farm Management

110—FARM MANAGEMENT. A study of management and of the science of organ ing and operating farms. *Prerequisites: Agr. Econ.* 1 *and Econ.* 51. (3) I, II (Bradford)

111—ADVANCED FARM MANAGEMENT. An advanced analysis of managem and managing farms. *Prerequisite: Agr. Econ.* 110. (3) II (Nesius)

114—CURRENT FARM MANAGEMENT PROBLEMS. An analysis of the curr economic problems in farming, such as costs, technological developments, demand chang and resource use. An introductory course designed primarily for professional workers agriculture. *Prerequisite: Agr. Econ.* 110, *or approval of instructor.* (3) S (Bradford)

115—FARM ACCOUNTING. A study of farm records and farm accounts includ farm cost accounting. *Prerequisite: Agr. Econ.* 110. (2) I (Byers)

116—LAND VALUE AND APPRAISAL. (Odd No. Years) The capitalization p cess, and other methods of valuing farm land; appraisal procedures of the Federal La Banks and other credit institutions. *Prerequisite: Agr. Econ.* 110, *or approval of instruct* (3) II (Bondurant)

117—TYPES AND SYSTEMS OF FARMING. (Even No. Years) Critical study of business organization and management of Kentucky farm businesses. Field trips requi *Prerequisite: Agr. Econ.* 110, *or approval of instructor.* (3) II (Bondurant)

118—FARM LABOR UTILIZATION. Efficient work method fundamentals as appl to agricultural production, work simplification analysis of specific farm jobs and incent payment plans for encouraging economic use of farm labor, are studied. *Prerequisite concurrent: Agr. Econ.* 110. (3) I (Byers)

Production Economics

120—PRODUCTION ECONOMICS FOR THE AGRICULTURAL SCIENCES. E nomic analysis of agricultural production. A theoretical treatment of land and capital turns, costs and related functions of agricultural production at an elementary level. *requisite: Agr. Econ.* 110. (3) I (Jensen)

121—COST, PRICE AND PRODUCTION RELATIONSHIPS IN AGRICULTU Will acquaint the student with data (and their use) on production expenses, cost of p duction, prices paid, prices received, agricultural production, and farm income. Desig primarily for professional workers in agriculture. *Prerequisite: Agr. Econ.* 110, *and proval of instructor.* (3) II (Nesius)

220a—ECONOMICS OF AGRICULTURAL PRODUCTION, STATIC APPLICATI Application of economic principles to agricultural production problems of resource comb tion, enterprise selection, scale of operations, household-firm relationships, inter-regio competition, and national agricultural policies and programs. *Prerequisite: Approval of structor.* (3) I (Jensen)

220b—ECONOMICS OF AGRICULTURAL PRODUCTION. DYNAMIC APPLI TION. A continuation of 220a with application to dynamic situations. *Prerequisite: 22 and approval of instructor.* (3) II (Nesius)

Agricultural Statistics

130—AGRICULTURAL STATISTICS. Principles and methods involved in the analysis, interpretation, and use of agricultural statistics including variation, correlation, standard errors, and simple analysis of variance. (3) I, II (Card, Clark, H. B.)

230—STATISTICS FOR AGRICULTURAL RESEARCH—SOCIAL SCIENCES. Multiple and partial correlation, test of reliability, sample surveys, and other techniques for agricultural research. *Prerequisite: Agr. Econ.* 130 *or equivalent.* (3) II (Card)

231—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. *Prerequisite: Agr. Econ.* 130 *or equivalent.* (3) II (Card)

Agricultural Policy and Land Economics

140—AGRICULTURAL POLICY. Historical development of principles underlying agricultural policy; objectives of agricultural policy; appraisal of current and proposed agricultural programs. *Prerequisite: Agr. Econ.* 100. (3) I (Price)

145—LAND ECONOMICS. Institutional, technological and physical forces affecting the use of land resources in agriculture. Analysis of problems connected with land tenure, land conservation and transfer of farm real estate. *Prerequisite: Agr. Econ.* 110, *or approval of instructor.* (3) II (Redman)

240—ADVANCED AGRICULTURAL POLICY. Impacts of policies upon economic progress, efficiency in resource use, distribution of income, and welfare in agriculture. *Prerequisite: approval of instructor.* (3) I (Price)

Agricultural Prices and Finance

150—AGRICULTURAL PRICES. Price behavior of agricultural products including supply-price relationships and general price level relationships. *Prerequisite: Econ.* 51. (3) II (Vennes)

155—AGRICULTURAL AND FARM FINANCE. Credit needs of agriculture; problems connected with farm and market agency financing; organization and operation of agricultural credit agencies. *Prerequisite: Agr. Econ.* 110. (3) I, S (Clark, C. M. and Bradford)

250—ADVANCED AGRICULTURAL PRICES. Advanced study of agricultural price behavior by the application of economic theory and statistical analysis. *Prerequisite: approval of instructor.* (3) II (Rudd)

Special Problems

160—SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. Directed independent study of a selected problem. *Prerequisite: approval of instructor and head of department.* (3) I, II (Brown and Staff)

160a-c—SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. Open to graduate students who have the necessary training and ability to do research on some selected problem. *Prerequisite: approval of head of department.* (3) I, II, S (Brown and Staff)

Research Methods

216—RESEARCH METHODS IN AGRICULTURAL ECONOMICS. An analytical examination of research methods and techniques used in agricultural economics. *Prerequisite: approval of instructor.* (3) I (Jensen)

Seminar

200a-d—AGRICULTURAL ECONOMICS SEMINAR. (Analysis of economic problems which affect agriculture). (0) I, II (Staff)

Thesis

500-1, 2, 3—Thesis (0) credit. (Staff)

HOME ECONOMICS

Courses in Foods and Nutrition

101—PRINCIPLES OF NUTRITION. A non-technical course on the essentials adequate diet for optimum health and on food plans to fit physiological, and environme factors. Lecture and discussion, 3 hours. Not open to home economics majors. (3) II, S (Clemmons)

102—DIETETICS. Daily food requirements at different age levels and different e nomic levels. Practice is given in setting up normal dietaries for individuals, families other groups. Lecture, 2 hours; lab, 2 hours. *Prerequisites: H. E. 6 and 11.* (3) I, II, S (Clemmons)

103a, b—COMMUNITY NUTRITION. Study of nutrition education with emph on causes and effects of malnutrition, methods of judging nutrition and development health programs in public schools. Lecture, 2 hours; lab, 2 hours. *Prerequisite (or to taken concurrently): H. E. 102.* (3) I, II, S (Clemmons)

105a-c—EXPERIMENTAL COOKERY. Study of factors that affect the results tained in cooking and food preparation processes. Experimental work under controlled ditions. Lecture, 1 hour; lab, 4 hours. *Prerequisites: Chem. 37, H. E. 5 or approval instructor.* (3) I, II, S (Helton)

106a-d—FIELD WORK IN NUTRITION. Nutrition problems at different age le correlated with surveys and experimental studies to show the relation between diet select and its physical and mental effects. Lecture and lab. *Prerequisites: H. E. 103a, b, or proval of instructor.* (1) I, II, S (Clemmons)

107—WORKSHOP IN NUTRITION. This workshop gives opportunity to workers the field of nutrition to obtain help in presenting community nutrition programs. nutrition problem is analyzed in its relation to agricultural and socio-economic problems. (4) Alternate S (Erikson)

108a-c—SEMINAR IN NUTRITION. Investigations of recent research in nutrit *Prerequisite: senior or graduate standing.* (1) I, II (Erikson)

111—ADVANCED NUTRITION. Application of biochemistry to understanding of utilization of nutrients for body processes. Laboratory work includes analysis of diges juices, blood and urine and balance experiments. Lecture, 2 hours; lab, 4 hours. *Pre uisite: H. E. 11.* (4) I (Erikson)

112—NUTRITION IN DISEASE. Metabolic processes of the body in normal and eased conditions, correlating the metabolic changes due to disease with diet therapy. ture, 2 hours; lab, 4 hours. *Prerequisite: H. E. 102. Prerequisite or concurrent: H. E.* (4) I (Erikson)

114—FOOD PRESERVATION. Principles of home food preservation. Canning, de dration and freezing of fruits, vegetables and meats; pickling of fruits and vegetables; m ing of jams, jellies and preserves; brining. *Prerequisites: Bact. 52 and H. E. 5.* (3) II, S (Helton)

115a, b—FOOD FOR SPECIAL OCCASIONS. Advanced work in culinary arts skills. Preparation of attractive and appetizing dishes to help the homemaker in plann buffet suppers, receptions, picnics, wedding parties, formal meals. Lab, 4 hours. *Pre iusites: H. E. 5 and 6.* (2) S (Barkley)

119a-c—SPECIAL PROBLEMS IN FOODS AND NUTRITION. Intensive work a specific phase of the field. *Prerequisite: senior or graduate standing.* (2) I, II (Erikson and Clemmons)

206a-d—ADVANCED FIELD WORK IN NUTRITION. The course is a continua of H. E. 106a-d with investigations of recent research in the field. Lecture and lab. *requisites: H. E. 103 and 106a, or approval of instructor.* (1) I, II, S (Clemmons)

208a-c—SEMINAR IN NUTRITION. (2) I (Erikson)

219a-c—SPECIAL PROBLEMS IN FOODS AND NUTRITION. Independent vanced work on a specific problem. (2) I, II (Erikson and Clemmons)

Courses in Clothing, Textiles, and Related Art

125—ADVANCED TEXTILES. Individual semester reports with emphasis on developments in textile industry. Class project to determine various types of textiles color fastness, tensile strength, and other factors important in fabric construction. Lect 1 hour; lab, 2 hours. *Prerequisite: H. E. 25, 161.* (2) (Guenther)

126—COSTUME DESIGN. The arts of costume today and throughout the past. tumes are designed to meet today's needs. Lecture, 1 hour; lab, 4 hours, *Prerequi H. E. 27 and Art 30.* (3) I, S (Downe

127—ADVANCED CLOTHING. The making of foundation and creative pattern signs, also creative design through draping, with emphasis on accurate fittings. Lectu hour; lab, 4 hours. *Prerequisite: H. E. 27.* (3) I, II, S (Guenthe

128a-c—SPECIAL PROBLEMS IN CLOTHING AND COSTUME DESIGN. Inte work on specific phases of the field. Senior or graduate standing. (2) I, II, S (Guenther and Downe

129—INTERIOR DECORATION. A study of color, line, and texture as used to create effective interiors suited to modern living. Lecture, 2 hours; lab, 2 hours. *Prerequisites: H. E.* 25, 61; *Art* 30; *or approval of instructor.* (3) II, S (Downer)

130a, b—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. Lab, 4 hours. *Prerequisite: H. E.* 129. (2) I, II (Downer)

134—ECONOMICS OF CLOTHING. The clothing industry, its influence and economy. Field trips to study mass production, class project and individual semester reports. Lecture, 1 hour; lab, 2 hours. *Prerequisites: H. E.* 27 *and* 161. (2) II, S (Guenther)

135—DECORATIVE TEXTILES — Survey of techniques used in applying color and design to fabrics. Individual problems, demonstrating techniques. Lecture, 1 hour, lab, 2 hours. *Prerequisites: H. E.* 25 *and Art* 30. (2) II, S (Guenther)

136a-c—SPECIAL PROBLEMS IN TEXTILES. Intensive work on specific phases of the field. Senior or graduate standing. (2) I, II, S (Guenther)

137—TAILORING. Analysis of tailoring technique in the shop and in the home. Tailored garments are planned and constructed. Lab, 4 hours. *Prerequisite: H. E.* 127. (2) I, S (Clothing Staff)

138a-c—SPECIAL PROBLEMS IN INTERIOR DECORATION. Intensive work on specific phases of the field. Senior or graduate standing. (2) I, II (Downer)

139—ADVANCED INTERIOR DECORATION. The art of interior decoration throughout the past and today. Interiors are planned to meet today's needs. Lecture, 1 hour; lab, 2 hours. *Prerequisite: H. E.* 129. (2) II, S (Downer)

228a-c—SPECIAL PROBLEMS IN CLOTHING AND COSTUME DESIGN. Independent advanced work on a specific problem. Graduate standing. (2) I, II, S (Downer and Guenther)

236a-c—SPECIAL PROBLEMS IN TEXTILES. Independent advanced work on a specific problem. (2 ea.) I, II, S (Guenther)

237a-c—SEMINAR IN TEXTILES, CLOTHING, COSTUME DESIGN AND INTERIOR DECORATION. Investigation of special textile, clothing, costume design or interior decoration problems. Lecture, 2 hours. (2) I, II (Downer and Guenther)

238a-c—SPECIAL PROBLEMS IN INTERIOR DECORATION. Independent, advanced work on a specific problem. (2) I, II, S (Downer)

Courses in Institution Management

140—THE SCHOOL LUNCH. Designed for teachers who manage the lunchroom. Consideration will be given to equipment, menus, purchase, storage, preparation and service of food. Lecture, 2 hours; lab, 2 hours. *Prerequisites: H. E.* 5 *and Econ.* 51. (3) I, II, S (Helton)

141—INSTITUTION ORGANIZATION AND MANAGEMENT. Principles of institution organization, types of institution service, personnel and financial management. Legal aspects of institution management. Personal and professional qualifications of an institution manager. *Prerequisites: H. E.* 41 *and* 42. (3) II (Helton)

142a-c—INSTITUTION ADMINISTRATION. Application of scientific principles of institution management. Practice is given in office management in different food units on the campus. *Prerequisite: H. E.* 141. (2) I, II, S (Helton)

143—INSTITUTION EQUIPMENT. Selection, arrangement, cost and care of equipment. Problems of lighting, heating, ventilation and refrigeration. Two field trips taken to neighboring cities to see equipment in institutions. *Prerequisite: H. E.* 42. (3) II (Helton)

149a-c—SPECIAL PROBLEMS IN INSTITUTION MANAGEMENT. Intensive work on specific problems. Senior or graduate standing. (2) I, II (Helton)

249a-c—SPECIAL PROBLEMS IN INSTITUTION MANAGEMENT. Independent, advanced work. (2) I, II (Helton)

Courses in Child Development

150—TECHNIQUES OF GUIDANCE FOR THE PRESCHOOL CHILD. An opportunity for extensive laboratory assistance in the nursery school for students who wish to develop skills in working with children. Lecture, 2 hours; lab, 4 hours. *Prerequisite: H. E.* 152. (4) II (McDowell)

152—CHILD CARE AND DEVELOPMENT. Increased understanding of children through study of the normal development, care and guidance of the preschool child. Observation and participation in nursery school. Lecture, 2 hours; lab, 2 hours. *Prerequisite: H. E.* 52. (3) I (Bentley)

154—FAMILY LIVING. A study of the influences which bear upon the home and family with emphasis on preparation for successful marriage and parenthood. Lecture, four hours and occasional field trips. (4) I, II, S (McDowell)

155—THE CHILD AND HIS CLOTHING. A detailed study of the selection, cost a care of the preschool child's clothing in relation to his needs. Lectures and occasional fi trips. *Prerequisite: H. E.* 52. (3) S (Staff)

156—PLAY AND PLAY MATERIALS. Play activities of young children, relation play equipment to development and characteristics of good play materials. Toys suitable the preschool child. Lecture, 1 hour; lab, 2 hours. (2) S (Bentley)

157—INFANT DEVELOPMENT. Study of development, care and guidance of child during prenatal, natal, and infant periods. Lecture, 2 hours. *Prerequisite: A. & P.* (2) S (Bentley)

158—FOOD FOR CHILDREN. Experience in selection, preparation and serving food to young children. Emphasis is placed on the preschool age and the factors importa in establishing good food habits. *Prerequisite: H. E.* 6, 11, 52. (3) II, S (Staff)

159a-c—SPECIAL PROBLEMS IN CHILD DEVELOPMENT AND FAMILY LI ING. Intensive work on specific problems. Senior or graduate standing. (2) I, II (Bentley)

259a-c—SPECIAL PROBLEMS IN CHILD DEVELOPMENT AND FAMILY LI ING. Independent advanced work. (2) I, II (McDowell)

Courses in Home Management

161—CONSUMER PROBLEMS. Consumer buying, its social and economic aspe An analysis of problems of the manufacturer, merchant and consumer in order to und stand the needs and responsibilities of each group. Lecture, 3 hours. *Prerequisites: Ec* 51; *and H. E.* 61. (3) I, S (Wilmore)

162a—HOME MANAGEMENT AND FAMILY RELATIONSHIPS. Philosophy principles of home management. Study of the mechanics of time, energy and money m agement, personal development, social and family relationships. Lecture, 2 hours. *Prer uisites: Econ.* 51; *and H. E.* 61. (2) I, II (Wilmore)

162b—HOME MANAGEMENT AND FAMILY RELATIONSHIPS. A residence per in the Home Management House is required of seniors in home economics. Experience the application of principles presented in other courses. *Prerequisite: H. E.* 162*a; prer uisite or concurrent: H. E.* 102. (3) I, II, S (Wilmore)

169a-c—SPECIAL PROBLEMS IN HOME MANAGEMENT. Intensive work on spec phases of home management. Senior or graduate standing. (2) I, II (Wilmore)

262—ADVANCED HOME MANAGEMENT AND FAMILY RELATIONSHIPS. course affording opportunity for special study of social and economic problems affec family life. Lecture, 3 hours. *Prerequisite: H. E.* 162*b*. (3) II (Wilmore)

269a-c—SPECIAL PROBLEMS IN HOME MANAGEMENT. Independent advan work. (2) I, II (Wilmore)

General Courses

175—RURAL COMMUNITY ANALYSIS. The nature of the town-country commu with special emphasis on the function of institutional and agency programs and t leaders in relation to the community. Same course as R. S. 160. (3) I, S 1952 (Bauder, Ramsey

500-1, 2, 3—THESIS. No credit (Staff

HORTICULTURE

102—PRINCIPLES OF SPRAY PRACTICE. A study of the principles and pra of spraying for the control of pests of horticultural crops. Lecture, 1 hour; lab, 2 h *Prerequisites: Hort.* 1, *Chem.* 4*a*, *Ag. Ent.* 1. (2) I (Waltman

103—POMOLOGY: DECIDUOUS TREE FRUITS. A course dealing with the th and practice of commercial tree fruit production, with major emphasis on apple grow Lectures, 2 hours; lab, 2 hours. *Prerequisite: Hort.* 1. (3) I (Waltman

105—POMOLOGY: SMALL FRUITS. A detailed study of the care and manage of commercial plantings of strawberries, raspberries, and other bush fruits. Lectures, 1 h lab, 2 hours, first half; lectures, 2 hours, last half. *Prerequisite: Hort.* 1. (2) I (Waltman

106a-c—SPECIAL PROBLEMS IN POMOLOGY. This course is designed to meet need for advanced work. *Prerequisites: Hort.* 1 *and one of the following*—103 *or* 105. (3 ea.) I, II, S (Waltman

110—THE PRINCIPLES OF VEGETABLE GARDENING. A study of the fu mental principles underlying commercial production of vegetables. Lectures, 2 hours; 2 hours. *Prerequisites: Hort.* 1, *Agron.* 10. (3) I (Emmer

111—GROWING VEGETABLE PLANTS UNDER GLASS. Production of vege plants grown for transplanting; types of hotbeds, cold frames, and simple greenhouse tures. Lectures, 2 hours; lab, 2 hours. *Prerequisite: Hort.* 110. (3) I (Emmer

112a-c—SPECIAL PROBLEMS IN VEGETABLE CROPS. This course is designed to meet the need for advanced work. *Prerequisites: Hort.* 1, 110, *and approval of instructor.* (3 ea.) I, II, S (Emmert)

120—LANDSCAPE GARDENING. The adaptation of principles of landscape architecture; coordination of buildings with surroundings; identification and uses of decorative materials and their requirements. Lectures, 2 hours; lab, 2 hours. *Prerequisites: Hort.* 1, *Bot.* 1, 2. Offered 1951-52 and alternate years. (3) II, S 1953 (Elliott)

121—ADVANCED LANDSCAPE. A continuation of Horticulture 120, with special emphasis on design and the use of materials. Lectures, 2 hours; lab, 2 hours. *Prerequisite: Hort.* 120. Offered 1952-53 and alternate years. (3) II (Elliott)

122—FLORICULTURE. A detailed study of specific groups of flowers such as bulbs, iris, and roses. Lectures, 2 hours. *Prerequisite: Hort.* 22. Offered 1952-53 and alternate years. (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; lab, 2 hours. *Prerequisites: Hort.* 1, 120; *Bot.* 1, 2. Offered 1951-52 and alternate years. (3) II (Elliott)

124a-d—SPECIAL PROBLEMS IN ORNAMENTAL HORTICULTURE. This course is designed to meet the need for advanced work. *Prerequisites: Hort.* 1, 120, 121; *Bot.* 1, 2; *and approval of instructor.* (3 ea.) I, II, S (Elliott)

125—PLANTS AND PLANTING MATERIALS. A study of woody and herbaceous plants and their identification, suitability for landscape uses and the effects produced. Lecture, 1 hour; lab, 2 hours. *Prerequisite: Hort.* 120 *or approval of instructor.* Offered 1952-53 and alternate years. (2) II (Elliott)

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

201a-c—RESEARCH IN HORTICULTURE. *Prerequisite: approval of instructors.* (3 ea.) I, II, S (Olney and Staff)

Forestry

110—WOOD IDENTIFICATION AND TECHNOLOGY. General anatomy of wood, identification of commercial species of the United States based on gross and microscopic features. Properties and uses. Lectures, 2 hours; lab, 2 hours. *Prerequisites: For.* 1 *or* 2; *Bot.* 1; *and approval of instructor.* (3) II (Davenport)

111—LUMBER AND OTHER FOREST PRODUCTS. Manufacture, grading, and seasoning of lumber. Forest products other than logs or lumber, their methods of utilization and markets. Lectures, 3 hours. *Prerequisite: For.* 1 *or* 2 *and approval of instructor.* (3) II (Davenport)

115—WOOD CONDITIONING. The methods and principles involved in seasoning, changes in physical properties, and preservation of wood. *Prerequisite: For.* 1 *or* 2. (3) I, S (Davenport)

120a-c—SPECIAL PROBLEMS IN FORESTRY. This course is designed to meet the need for advanced work. *Prerequisites: For.* 110 *and* 111, *and approval of instructor.* (3 ea.) I, II, S (Davenport)

RURAL SOCIOLOGY

115—ORGANIZATION OF RURAL GROUPS. A study of the dynamics of organized groups; leadership, membership participation, and program planning in agricultural organizations and other organized rural groups. *Prerequisite: an introductory course or consent of instructor.* (3) I (Brown)

125—RURAL MOVEMENTS AND SOCIAL POLICY. Social factors in selected rural movements, their organization and development, influence upon governmental policy, and the social needs met. *Prerequisite: an introductory course or consent of instructor.* (3) I (Brown)

160—RURAL COMMUNITY ANALYSIS. The nature of the town-country community, with special emphasis on the function of institutional and agency programs and their leaders in relation to the community. Same course as H. E. 175. (3) I (Ramsey, Sanders)

180—ADVANCED RURAL SOCIOLOGY. Systematic study of the structure and function of family, informal and locality groups, social strata, religious, educational, political and occupational groups in rural society. (3) II (Brown)

190a-c—SPECIAL PROBLEMS IN RURAL LIFE. Supervised individual study in selected sub-fields of rural sociology. Population, standards of living, neighborhood and community change, and rural institutions are among the available fields for investigation. (2) I, II (Staff)

200a-c—RESEARCH IN RURAL SOCIOLOGY. Individual graduate research with correlated study of rural social research types and methods. (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. (3) I (Beers)

220—SEMINAR IN RURAL ATTITUDES. The nature and genesis of rural attitud and their relation to rural social control; analysis of contemporary rural attitudes a opinion. (3) II

230—RURAL URBAN RELATIONS. Interdependence of city and country; solida and antagonistic relationships of city and country; the process of urbanization, and pro lems of rural adjustment to urban influences. (3) II

250a, b—TOPICAL SEMINAR. Analysis of topics of scientific interest in rural so ology, selected from such fields as the following: criticism of research; sociological fact in land use; migration; rural social ecology of the South; highland societies. (3) I, II (Staff)

SOCIOLOGY *(See page 79)*

II. ARTS AND SCIENCES

ANATOMY AND PHYSIOLOGY

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

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

105—ARCHITECTURE OF THE HUMAN SKELETON. Each bone is studied in detail with respect to its architecture, function, joint combination, and muscular relations. Lectures, two hours; laboratory, four hours. *Prerequisite: Junior standing.*
(4) II, S (Allen)

106—INTRODUCTION TO ENDROCRINOLOGY. The endocrine glands' general development, anatomical location, structure, and fundamental functions are studied. Lectures, three hours. *Prerequisites: A. & P. 10; Zoology 7b; Chemistary 1a, b.*
(3) I, S (Allen, Archdeacon)

107—COMPARATIVE NEURO-PHYSIOLOGY. A comparative study of Anatomy and Physiology of human nervous system with those of the lower animals. Lectures, two hours; laboratory, four hours. *Prerequisite: A. & P. 10.* (4) I (Allen)

108—CIRCULATION, RESPIRATION AND METABOLISM. The chemical and physical phenomena of respiration, circulation, and metabolic phases are emphasized. Lectures, two hours; laboratory, two hours. *Prerequisite: A. & P. 10.* (3) II, S (Archdeacon)

109—CELLULAR PHYSIOLOGY. An intensive study of general physiological principles with special emphasis on chemical and physical aspects of the cell. Lectures, two hours; laboratory, two hours. *Prerequisites: A. & P. 10; physics, and general chemistry.*
(3) I, S (Boyarsky)

110—INTERMEDIATE METABOLISM. Oxidation-reduction enzyme systems and intermediate metabolic phenomena are considered. Lectures, two hours; laboratory, two hours. *Prerequisites: A. & P. 10, physics and organic chemistry.* (3) I (Archdeacon)

201a-i—RESEARCH IN PHYSIOLOGY. An assigned problem, in which originality must be shown, is pursued. Conference and laboratory six hours. *Prerequisites: A. & P. 10; Chemistry 130a, 6; physical chemistry desirable; physics, one year.*
(3 ea.) I, II, S (Allen, Archdeacon, Boyarsky)

202—PHYSIOLOGICAL TECHNIQUES. Operational procedures are undertaken in gastrointestinal, hemodynamic, and respiratory systems. Lecture, one hour; laboratory, two hours. *Prerequisite: A. & P. 10 or equivalent.* (2) I (Archdeacon)

203—EXPERIMENTAL ENDOCRINOLOGY. Abnormalities of various endocrine glands are produced experimentally and results thoroughly reported. Lecture, one hour; laboratory, two hours. *Prerequisite: A. & P. 106.* (2) II (Allen, Archdeacon)

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

205—ADVANCED NEURO-PHYSIOLOGY. Electrical analyses of nerve fibres and synapse are considered along with nerve impulse theories, reflexes, and metabolism. Lectures, two hours; laboratory, two hours. *Prerequisites: A. & P. 107, 109.* (3) II (Boyarsky)

210—PRINCIPLES OF PHYSIOLOGY. A general consideration of the body's various systems. Designed for majors in Psychology, Animal Husbandry, and associated fields. Lectures, two hours; laboratory, two hours. *Prerequisites: One year College Chemistry, One year College Physics.*
(3) I, II (Staff)

ANCIENT LANGUAGES AND LITERATURES

The Department of Ancient Languages requires, as a prerequisite for the master's degree 18 semester credits (or the equivalent) in the area of ancient languages and civilization. Students having deficiencies in such an equivalent will plan, in consultation with the Head of the Department, such a curriculum as will make up this deficiency.

The Department offers the master's degree in four fields: (1) Latin, (2) Greek, (3) ancient languages and civilization, and (4) the teaching of ancient languages. Both Plan A and Plan B are available.

Latin

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

109a, b—LATIN LITERATURE. Courses in various authors, periods, or types to su the needs of the class. *Prerequisite:* 12 *semester hours of Latin.* (3) I, II, S

114a, b—LATIN COMPOSITION. The writing of Latin prose of moderate difficul *Prerequisite: permission of instructor.* (1) I, II, S

121—ROMAN CIVILIZATION. Topics in the political, social, economic, and cultu life of ancient Rome down to Justinian, with special reference to the relation to modern li *No knowledge of Latin necessary.* (2) II, S

150—THE TEACHING OF LATIN. The place of Latin in general education. Dev opments in the teaching of Latin. The reading approach to learning Latin. Evaluation materials. (3) II, S

152a, b—STUDIES IN LATIN PHILOLOGY. Courses to meet the needs of stude in various areas of Roman philology, *e.g.*, in Latin literature, in Roman civilization, Latin linguistics, *etc. Prerequisite: permission of instructor.* (3 ea.) I, II, S

Note: See also "Classical Languages" below.

Greek

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

120—GREEK CIVILIZATION. Topics in the political, social, economic, and cultu life of ancient Greece, with special reference to the relation to modern life. *No knowle of Greek necessary.* (2) II, S

153a, b—STUDIES IN GREEK PHILOLOGY. Courses to meet the needs of stude in various areas of Greek philology, *e.g.*, in Greek literature, in Greek civilization, in Gr linguestics, etc. *Prerequisite: permission of instructor.* (3 ea.) I, II, S

156—GREEK TRAGEDY. Selected plays from Aeschylus, Sophocles, and Euripi Lectures on Greek tragedy and its effect on the Western World. *Prerequisite: A. L.* or 54. (3) I

157—GREEK COMEDY. Selected plays of Aristophanes. Lectures on Greek com and its effect on the Western World. *Prerequisite: A. L.* 156. (3) I

204—THE GREEK OF THE NEW TESTAMENT. Class and/or individual wor suit the needs of the students. Reading and research to suit the needs of the student. *requisite: two years of college Greek.* (3) I, II,

Note: See also "Classical Languages" below.

Classical Languages

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

122b—CLASSICAL DRAMA IN ENGLISH TRANSLATION. Selected tragedies comedies of both Greek and Roman dramatists. Interpretation of the plays in the lig their meaning to the Greeks and Romans. *No knowledge of Greek or Latin required.* (3)

151a-d—INDEPENDENT WORK IN ANCIENT LANGUAGES. Courses to meet needs of the student will be arranged in various areas of classical philology, e.g., in G or Latin writers, in classical civilization, in Greek or Latin linguistics, etc. *Prerequisite: mission of instructor.* (3 ea.) I, II,

200—RESEARCH IN THE TEACHING OF CLASSICAL LANGUAGES. Rese may be done (with reference to secondary and/or higher education) in methods, in prep tion of materials, in curricula, or in the place and history of classical study in educa *Prerequisite: A. L.* 150. (3) I, II,

201—COMPARATIVE GREEK AND LATIN GRAMMAR. Studies and research in comparative linguistics, historical syntax, semantics, and other aspects of linguistics in the Greek and Latin area. *Prerequisite: Necessary command of languages involved.* (3) I, II, S

205—INTENSIVE STUDY OF AN AUTHOR. Studies and research in the work of an author (Plato, Aristotle, Lucretius, Caesar, Ovid, or Horace): sources, milieu, purposes, language, and influence on later periods. *Prerequisite: Necessary command of languages involved.* (3) I, II, S

206—INTENSIVE STUDY OF A PERIOD. Studies and research in a period (Age of Pericles, Hellenistic Age, Ciceronian Age, Augustan Age, Silver Age, Christian Latin, or Medieval Latin): literary, social, and linguistic trends, sources, and later influence. *Prerequisite: Necessary command of languages involved.* (3) I, II, S

207—INTENSIVE STUDY OF A LITERARY GENRE. Studies and research in a genre (epic, tragedy, comedy, satire, history, or the novel) in the ancient world, with some attention to its effect on later periods. *Prerequisite: Necessary command of languages involved.* (3) I, II, S

Hebrew

Note: Courses in beginning Hebrew and Hebrew reading in prose and in poetry will be offered on the graduate level for students in the Department (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.

154a, b—STUDIES IN SEMITIC PHILOLOGY. Courses to meet the needs of students in various areas of Semitic philology, *e.g.*, in literature, in civilization, in linguistics, etc. (3 ea.) II

Note: See also A. L. 151a-d.

ANTHROPOLOGY

103a-d—INDEPENDENT WORK IN ANTHROPOLOGY. Individual research problems in archeology, ethnology, or physical anthropology. (Offered every year.) (3) I, II, S (Staff)

107—ETHNOLOGY OF THE NEW WORLD. Cultures and physical types of the American Indians during and after White settlement. (North-western North America is not included.) (3) II (Essene)

111—ARCHEOLOGICAL THEORY AND METHODS. The concepts and aims of archeology, its history as a scientific discipline and its present role in the social sciences. *Prerequisites: Anthro.* 2, 114, 115, *or* 116. (3) II (Thompson)

112—ARCHEOLOGY OF KENTUCKY. A rapid survey of the more important prehistoric cultures found in North America and the sequence of cultures found in Kentucky to the time of the white settlers. (3) II (Thompson)

114—PREHISTORIC MESO-AMERICA AND PERU. An intensive study of the native American civilizations: their origins, development and achievements. (3) I (Thompson)

115—NORTH AMERICAN ARCHEOLOGY. A study of the origin and growth of prehistoric American Indian cultures north of Mexico as revealed by archeological data. (3) II (Thompson)

116—BEGINNINGS OF CIVILIZATION. Prehistory of the Near East, the earliest evidences of agriculture, pottery, smelting, writing, law codes, kingship, priesthood, and science. *Prerequisite: one course in Anthro.* (3) I (Thompson)

117—DIFFUSION OF CIVILIZATION. Prehistory of the Far East, Europe, and Negro Africa and ethnology of primitive tribes in these areas, and the spread of Near Eastern civilization. *Prerequisite: Anthro.* 116. (3) II (Essene)

118—CULTURES OF THE SOUTHWESTERN UNITED STATES. Development of sedentary and nomadic Indian peoples, from earliest times to the present.

125—PHYSICAL ANTHROPOLOGY. Lecture-laboratory course on the biological nature of Man: the primates, fossil man, races, race mixture, constitutional anthropology and human growth. *Prerequisite: Anthro.* 1 *or three hours in any other Bio. Science.* (4) II (Snow)

126—HUMAN ANCESTRY. A lecture-laboratory course on human origins and the fossil remains of Pleistocene man throughout the world; the lineage, formation and interbreeding of modern races. *Prerequisite:* 125 *or special permission.* (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: Anthro.* 1 *and* 2. (3) I (Essene)

131—ETHNOLOGY OF OCEANIA. A survey of the various cultures to be found the islands of the Pacific Ocean. Both aboriginal and modern acculturated societies will considered. Lectures, 3 hours. *Prerequisites: Anthro.* 1 *and* 2. (3) II (Essene)

140—MYTHOLOGY. The unwritten literature of primitive peoples. Themes, diffusi style, literary devices, and function of myths. (3) II (Essene)

141—APPLIED ANTHROPOLOGY. Application of anthropological methods to c temporary practical problems such as acculturation, colonial administration, intercultu education, and race relations. *Prerequisite: Anthro.* 2. (3) II (Essene)

142—CULTURE AND PERSONALITY. The cultural basis of personality. Perso character considered as the result of culturally fostered patterns. The ideal personality several selected societies. (3) II (Essene)

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

180—ANTHROPOLOGY: MAN AND HIS WORKS. Survey of the major fields Anthropology: physical, prehistory, and ethnology and a guide to source material. Desig for students not contemplating further work in Anthropology. (3) I, S (Staff)

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

203a-d—RESEARCH PROBLEMS IN ANTHROPOLOGY. Intensive study in fields of Physical Anthropology, Archeology, and Ethnology with qualified staff memb Term papers required. (3 ea.) I, II, S (Staff)

ART

As prerequisite to graduate work in art, the Department requires that student shall have had preliminary work in art equivalent to that required of majors in art. In general this means the completion of an undergraduate quence of six to eight full semester courses in drawing, design and paintin balanced by four to six courses in the history of art, and a reading knowled of either French or German. The graduate program in art provides for creati work in painting, design, etc., study and research in history and criticism of and also in the field of art education. Any of these may be emphasized. every case a written thesis is required.

The department is housed in a modern building with special equipme Studios for practical work are designed to meet professional standards. An library adjoins the classrooms. There are extensive collections of photograp color reproductions, and related art reference materials. An exhibition gall provides for the study of original works of art. The Department itself ha working collection of paintings, prints and drawings.

116a, b—PRINTMAKING. Technical instruction in printmaking processes: lithograp etching, wood cut. Open to advanced students. Six studio hours. *Prerequisites: Art and* 65*a*. (2) I, II (Sternberg

138—NORTHERN RENAISSANCE ART. The arts of the Renaissance and Refor tion outside Italy from the late middle ages through the sixteenth century. North humanism; analyses of style; study of individual masters. Illustrated lectures and rep (2) I (Rannell

140—ITALIAN RENAISSANCE ART. The arts of the Renaissance in Italy from late middle ages through the sixteenth century. Italian humanism; analyses of style; s of individual masters. Illustrated lectures and reports. (3) I (Rannell

141—BAROQUE ART. The arts of the Reformation and Counter-reformation in Eu from the mid-sixteenth century through the eighteenth century. The baroque and ro styles; study of individual masters. Illustrated lectures and reports. (3) II (Rannell

142—MODERN ART. The arts in Europe and America from the mid-eighteenth tury through the nineteenth century. Consideration of social and economic change relation to art; study of individual artists. Illustrated lectures and reports. (3) I (Rannells, Amyx

143—CONTEMPORARY ART. The arts of the twentieth century in Europe and Americas. Consideration of social and technological changes in relation to art; stud individual artists. Illustrated lectures and reports. (3) II (Amyx, Rannell

145a—HISTORY OF ARCHITECTURE. A survey of architectural developments ancient times through the 18th century. Analysis of classic, medieval, renaissance baroque styles. Illustrated lectures and reports. (2) I (Rannell

145b—HISTORY OF ARCHITECTURE. A study of modern architecture, 19th and 20th centuries. Emphasis on contemporary developments. Illustrated lectures and reports. (2) II (Rannells)

147—ART IN AMERICA. A survey of American architecture, sculpture, painting, industrial design, etc., from Colonial times to the present. American museums, exhibitions, sales. 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) II (Amyx)

153—AESTHETICS. Problems of method in aesthetics; major types of aesthetic theory. Aesthetic materials of the arts, in literature, music and the space arts. Form and types of form. Meaning in the arts. Interrelations of the arts. Lectures, discussions, reports. (3) I (Amyx)

155—ART IN ELEMENTARY SCHOOLS. An advanced course for in-service teachers in elementary schools. Programs of instruction related to the development levels of vision and expression in the child. Lectures, conferences, studio work and reports. Given in collaboration with the College of Education. (2) S (Weismann)

157—ART IN THE SECONDARY SCHOOL. Art for teachers in secondary schools. The literature of art education. Courses of study. Teaching materials. Lectures, conferences, and reports. (3) S (Rannells, Amyx)

160a, b—SEMINAR IN ART. Current problems in art; correlations of theory and practice; discussions and reports. For seniors and graduates majoring in art. 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 procedures. Nine studio hours. *Prerequisites: Art* 63 *and* 65*b*. (3) I, II, S (Amyx)

167—PROFESSIONAL PAINTING TECHNIQUES. Advanced problems in painting media: oil and tempera. Historical and contemporary procedures in painting and closely related media. Open to advanced students. Nine studio hours. *Prerequisite: Art* 165*b*. (3) I, II (Amyx)

175a-d—INDEPENDENT WORK: HISTORY, CRITICISM. Individual research and writing: history, criticism, aesthetics, etc. Collaboration with other humanistic disciplines. Each semester's work is subject to review by the staff. Open only to advanced students. (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. (3) I, II, S (Staff)

179a-d—INDEPENDENT WORK: DESIGN, CONSTRUCTION. Individual research and experimental work in technical and theoretical problems of design and construction of forms, including sculpture. Each semester's work is subject to review by the staff. Open only to advanced students. (3) I, II, S (Staff)

Note: The independent work courses provide for the student of special interests and abilities and enable him to supplement the work of regularly scheduled courses, including those in the field of art education.

BACTERIOLOGY

102—GENERAL BACTERIOLOGY. Microorganisms; their morphology, classification, physiology, relation to certain fermentations, to food, to soil fertility, and to disease. Lecture and recitation, 2 hours; laboratory, 4 hours. *Prerequisite: Chem.* 1*b*. (4) I, II, S (Scherago or Hotchkiss and others)

103—PATHOGENIC BACTERIOLOGY. Human and animal pathogenic microorganisms, especially their morphological, cultural, and pathogenic properties. Lecture, 2 hours; laboratory, 4 hours. *Prerequisites: Bact.* 102 *or* 52; *or* 2*b and Chem.* 1*b*. (4) I, S (Scherago and Humphries)

104—APPLIED BACTERIOLOGY. A course in bacteriological analysis to supplement Courses 52 and 102. Laboratory, 4 hours. *Prerequisites: Bact.* 102 *or* 52; *or* 2*b and Chem.* 1*b*. (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. Lab, 6 hours. *Prerequisite (or to be taken concurrently): Bact.* 103. (3) I, S (Hotchkiss)

110b—LABORATORY DIAGNOSIS. Continuation of 110a. Examination of blood continued. Laboratory diagnosis of parasitism and infectious diseases. Lab, 6 hours. *Prerequisite (or to be taken concurrently): Bact.* 103. (3) II, S (Hotchkiss)

111—GENERAL PATHOLOGY. Effects of disease will be studied at autopsies and by the examination of fresh and museum specimens and histological sections. Lect., 2 hours; Lab, 4 hours. *Prerequisites: Anat. and Physiol.* 10; *Zool.* 7*b*, 101*b*, *and* 106; *Bact.* 103. (4) I, S (Maxwell, Scherago, and Hotchkiss)

120a, b—HOSPITAL LABORATORY PRACTICE. Students will be required to carr out, under supervision, the laboratory work in one of the hospitals in Lexington. Lab, 1 hours, and 18 hours, respectively. *Prerequisites: Bact.* 110*a*, *b*.
(4, 6) I, II, S (Maxwell, Harrison, and others)

125—IMMUNOLOGY AND SEROLOGY. The theories and mechanism of infectio and immunity; preparation, standardization, and uses of biological products; serology. Lect 2 hours; lab, 6 hours. *Prerequisite: Bact.* 103. (5) II, S (Scherago and Humphries)

201a-j—RESEARCH IN BACTERIOLOGY. Laboratory, 10 hours.
(3) I, S (Scherago and others)

203a—PUBLIC HEALTH BACTERIOLOGY. Public health aspects of bacteriolog including the etiology, epidemiology, immunology and lab. diagnosis of infectious disease Lect., 2 hours; lab. diagnosis of infectious diseases. Lect., 2 hours; lab, 4 hours. *Prere uisite: 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 an recitations, 1 hour; laboratory, 4 hours. *Prerequisite: Bact.* 203*a*.
(3) II, S (Scherago and others)

206—BACTERIOLOGY OF FOODS. Dairy and miscellaneous food products; fo preservation; food poisoning. Standard methods for official food and public health la oratories. Lecture, 2 hours; laboratory, 4 hours. *Prerequisites: Bact.* 102 *or* 52; *or* 2*b* an *Chem.* 1*b*. (4) I, S (Weaver)

207—BACTERIOLOGY OF WATER AND SEWAGE. Microbiology of water; metho of purification. Sewage disposal methods. Operation of swimming pools. Standard an other methods for examination. Lecture, 2 hours, lab, 4 hours. *Prerequisites: Bact.* 102 52; *or* 2*b and Chem.* 1*b*. (4) II, S (Weaver)

210—CLINICAL MYCOLOGY. Methods and techniques for isolating and propagati pathogenic actinomycetes and fungi. Lab. diagnosis of fungous infections. Lab., 4 hours week. *Prerequisites: Chem.* 130*b; reading knowledge of one foreign language; Bact.* 125.
(2) I, S (Hotchkiss)

220—HISTORY OF BACTERIOLOGY. Conferences, 2 hours. *Prerequisite: Bact.* 1
(2) II, S (Weaver)

222—ADVANCED GENERAL BACTERIOLOGY. Bacterial cytology; theories staining. Microbial genetics. Taxonomy and nomenclature. Lectures and conferences, hours; lab, 4 hours. *Prerequisites: Bact.* 125 *and Chem.* 130. (4) I, S (Weaver)

224—DISINFECTANTS AND ANTIBIOTICS. Chemical agents injurious to micr organisms. Practical applications and methods of testing. Conferences, 1 hour; lab, 4 hou *Prerequisites: Bact.* 2*b*, *or* 52 *and* 104; *Chem.* 130*b*. (3) II, S (Hotchkiss)

226a—METABOLISM OF MICROORGANISMS. Chemical changes produced by micr organisms; properties of their enzymes; the physiology of their growth. Lectures or conf ences, 2 hours; lab, 4 hours. *Prerequisites: Chem.* 130*b; reading knowledge of German French.* (4) I (Weatherwax)

226b—METABOLISM OF MICROORGANISMS. Continuation of 226a. Lectures conferences, 2 hours; lab, 4 hours. *Prerequisite: Bact.* 226*a*. (4) II (Weatherwax)

235—IMMUNOCHEMISTRY AND ADVANCED IMMUNOLOGY. Chemistry of an gens and antibodies; of the reaction between them in vitro and in vivo; immune and hyp sensitive reactions. Lect. and conferences, 2 hours; lab, 4 hours. *Prerequisite: Bact.* 1 *Chem.* 130*b and* 143*b*. (4) II, S (Scherago and Humphries)

250a-j—SEMINAR. Review of current literature in bact.; presentation of papers work in progress in the department or on assigned topics; reports on meetings of natio bacteriological societies. Required of all graduate students. 2 hours. (1 ea.) I, II (Staff)

270—ELECTRON MICROSCOPY. Theory, operation and uses of the magnetic el tron microscope and the vacuum unit for metal shadow casting. Lecture, 1 hours; lab hours. *Prerequisites: Physics* 3*a*, *b*. (3) I, S (Edwards)

272—VIRUSES AND RICKETTSIAE. Natures, activities, and methods of laborat cultivation of viruses and rickettsiae; their relation to bacteria, plants, and animals. Le 2 hours; lab, 4 hours. *Prerequisite: Bact.* 125. (4) II, S (Edwards)

BOTANY

103—PLANT PHYSIOLOGY. A study of basic principles of plant physiology; w relations including internal movement, transpiration, and absorption; photosynthesis. T lectures and two two-hour lab periods per week. *Prerequisites: Botany* 1 *or* 25, *Chem* 1*b or* 4*b or equivalents*. (4) I (Henrickson)

104—PLANT PHYSIOLOGY. A study of elementary metabolism; mineral nutrit plant hormones; the physiology of vegetative and reproductive growth. *Prerequisite: Bo* 1 *or* 25, *Chemistry* 1*b or* 4*b or equivalent*. (4) II (Henrickson)

106a-c—SPECIAL PROBLEMS. Independent work in some phase of advanced any. *Prerequisite: consent of instructor*. (3 ea.) I, II (Staff)

107—MORPHOLOGY OF ALGAE. The economic value of algae and the struc and life histories of representative forms of the various groups. Three two-hour labor periods per week. *Prerequisite: 6 credits of botany*. (3) I (McIntee

114—ECOLOGY. The relationships existing between plants and their various factors of environment. Three lectures and one two-hour laboratory period per week. *Prerequisite: 6 credits of botany.* (4) II (McInteer)

115a, b—SEMINAR. Readings and reports on special topics. Required of all senior botany majors. (1 ea.) I, II (Staff)

124—ANATOMY OF VASCULAR PLANTS. The nature and origin of primary and secondary tissues and their distribution in plant organs. Three lectures and one two-hour laboratory period. *Prerequisite: 6 hours of botany.* (4) II (Riley)

125—MYCOLOGY. The structure, relations, and physiology of the fungi and their relations with and effects on other plants and animals. Two lecture-discussions and two two-hour lab periods per week. *Prerequisite: Botany 1 or its equivalent.* (4) I (Chapman)

126—ADVANCED MYCOLOGY. Detailed examination of the structure and physiology of specific groups of fungi that are of economic importance. Two lecture-discussions and two two-hour lab periods per week. *Prerequisites: Botany 125 or its equivalent and consent of instructor.* (4) II (Chapman)

130—INTRODUCTION TO HEREDITY. Chromosomal cytology and the principles of heredity; three lectures per week. *Prerequisite: 4 credits of biological sciences.* (3) I, II, S (Riley)

132—GENES AND THEIR ACTION. The nature and action of genes. Physiological genetics. Three lectures per week. *Prerequisites: Botany 30 or 130 or equivalent.* (3) II (Riley)

134—CYTOGENETICS. Chromosome aberrations and their importance in heredity and evolution. Three lectures and one two-hour laboratory period per week. *Prerequisites: Botany 3 or 130 or equivalent.* (4) I (Riley)

150a—ADVANCED SYSTEMATIC BOTANY. Qualified students will study assigned family groups from the standpoint of relationships. A detailed study of keys and various systems of Taxonomy. One lecture and two two-hour laboratory periods per week. *Prerequite: Botany 15.* (3) I

150b—ADVANCED SYSTEMATIC BOTANY. A continuation of Botany 150a. One lecture and two two-hour laboratory periods per week. *Prerequisite: Botany 150a.* (3) II

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. Three-hour laboratory periods per week. *Prerequisite: 6 credits of botany.* (3) II

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

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

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 ea.) (Henrickson)

213a, b—RESEARCH IN SYSTEMATIC BOTANY. Graduate students may carry on independent work that may be used in the preparation of their theses. *Prerequisite: Botany 150b.* (4 ea.) (McInteer)

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

235—PLANT CYTOTAXONOMY. Cytogenetic, geographical, ecological, and other factors that have influenced the origin and development of species of plants. Three lectures per week. *Prerequisites: Botany 15 and 134 or equivalents.* (3) II (Riley)

500-1, 2, 3—THESIS. (0) (Staff)

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 wh after completing not less than three years of graduate work in chemistry an allied fields, presents sufficient evidence of scholarly attainments. Evidence based on course work, research, examinations, and the dissertation.

110a, b—ADVANCED INORGANIC CHEMISTRY. A systematic course in inorgan chemistry with special emphasis upon the preparation and reactions of various types of organic compounds. Lectures, 2 hours. *Prerequisites: Analytical chemistry and orga chemistry.* (2 ea.) I, II, S (Ames)

111—ADVANCED INORGANIC LABORATORY. Laboratory exercises are chosen illustrate the methods of preparation of the different classes of inorganic compounds, and provide training in the newer techniques in the field. *Prerequisite: Chemistry* 110*a*. (1) II, S (Ames)

122—INSTRUMENTAL ANALYSIS. The applications of microscopic, colorimeti spectrophotometric, polargraphic, and electrometric methods. Lecture, 1 hour; lab, 6 hou *Prerequisite: Chemistry* 25*b*. (3) II, S (Wagner)

125—ADVANCED QUANTITATIVE ANALYSIS. The complete analysis of a silica mineral or ore, and the alloys of iron, copper, and aluminum. Lecture, 1 hour; lab, hours. *Prerequisite: Chemistry* 25*b*. (3) I (Wagner)

130a, b—ORGANIC CHEMISTRY. A systematic study of organic compounds. Lectu 3 hours; lab, 4 hours. *Prerequisite: Chemistry* 1*b or* 2*b*. (5 ea.) I, II, S (Barkenbus and Estes)

133—QUALITATIVE ORGANIC ANALYSIS. A systematic study of the separati and identification of organic compounds. Lecture, 1 hour; lab, 6 hours. *Prerequisi Chemistry* 130*b or* 30*b*. (3) I, S (Barkenbus and Smith)

136—SYNTHETIC ORGANIC CHEMISTRY. A critical comparison of preparati methods accompanied by laboratory work and reports. Lab, 9 hours. *Prerequisite: Che istry* 130*b or* 30*b*. (3) II, S (Barkenbus)

140a, b—PHYSICAL CHEMISTRY. The fundamental principles of chemistry are stud with emphasis upon the applications of these in the correlation of natural phenomena. L ture, 3 hours. *Prerequisites: Analytical Chemistry, Mathematics* 20*b and Physics* 3*b*. (3, 3) I, II, S (Dawson)

141—CHEMICAL THERMODYNAMICS. Principles and applications of chemi thermodynamics. Lecture, 3 hours. *Prerequisite: Chemistry* 140*b*. (3) II (Plucknett)

143—PHYSICAL CHEMISTRY. For students in Agriculture and the Biological S ences. Lecture and recitations, 3 hours; lab, 6 hours. *Prerequisites: Chemistry* 1*b or* and 27; *and Physics* 1*b*. (5) I

144a, b—PHYSICAL CHEMISTRY LABORATORY. Laboratory studies in physi chemistry to accompany 140a, b. Lab, 6 hours. *Prerequisites: Analytical Chemi Mathematics* 20*b; Physics* 3*b*. (2 ea.) I, II, S (Drenan)

145—COLLOID CHEMISTRY. Lectures, recitations, and assigned readings on chemistry of colloids. Lectures and recitations, 2 hours. *Prerequisite: Chemistry* 140*b*. (2) II (Black)

147a, b—PHYSICAL CHEMISTRY FOR ENGINEERS. The principles of phys chemistry are studied with emphasis upon the application of these in mining and me lurgical engineering. Lecture and recitation, 3 hours; lab, 3 hours. *Prerequisites: Chemi* 22, *Mathematics* 20*b, and Physics* 3*b*. (4 ea.) I, II (Dawson)

150a, b—PHYSIOLOGICAL CHEMISTRY. A study of the chemistry of living p esses. Lectures and recitations, 3 hours; lab, 3 hours. *Prerequisites: Chemistry* 1*b or* 25*a, and* 130*b*. (4 ea.) I, II (Smith)

160a, b—INDUSTRIAL CHEMICAL PROCESSES AND STOICHIOMETRY. A vey of the chemistry of various manufacturing processes, with some emphasis on calculat involving stoichiometrical relationships. Lecture, 2 hours. *Prerequisite: Chemistry* 140 (2 ea.) I, II (Meadow

164a, b—INDUSTRIAL CHEMICAL PRINCIPLES. Fundamental principles app to problems in industrial chemistry and chemical engineering. Lecture, 2 hours. *Pre uisite: Chemistry* 140*b*. (2 ea.) I, II (Plucknett

181—CHEMICAL LITERATURE. Training in the use of chemical literature. hour per week. *Prerequisite: Junior or Senior Standing.* (1) I (Black

182—LABORATORY ARTS. The fabrication of chemical apparatus of glass, m and plastics. *Prerequisite: Major in the Department of Chemistry with Junior standing* (2) I,

188a, b—SEMINAR. Reports and discussions on recent research and current chem literature. Required of all seniors. Attendance at the seminar for two semesters is req before the one hour of credit is earned. (0, 1) I, II (Staff

215a, b—RADIOCHEMISTRY. The chemistry of the radioactive elements and substances involved in nuclear reactions. Lecture, 2 hours. *Prerequisite: Chemistry* 1 (2 ea.) I, II (Ame

220—ADVANCED QUALITATIVE ANALYSIS. A study of qualitative analysis the anions and the separation and detection of the less common elements, employing a p cochemical method of approach to the theory of separation. Lecture, 1 hour, lab, 6 h (3) I (Wagne

221—SEMIMICRO QUANTITATIVE ANALYSIS. The applications of semimicro and micro techniques to the quantitative analysis of both organic and inorganic substances. Lecture, 1 hour; lab, 6 hours. *Prerequisite: Chemistry* 140*b*. (3) (Hammaker)

223—OPTICAL METHODS OF ANALYSIS. An intensive study of the theory and applications of each of the following methods: emission spectroscopy, absorption spectrophotometry, colorimetry, refractometry, and polarimetry. Lab, 6 hours. *Prerequisite: Chemistry* 122 *and* 140*b*. (2) (Hammaker)

227—MICROSCOPIC ANALYSIS. Qualitative and semi-quantitative analysis of microgram amounts of various cation groups in a single drop under a microscope. Laboratory, 6 hours. *Prerequisite: Chemistry* 21*b*. (2)

228—PRINCIPLES OF ANALYTICAL CHEMISTRY. An advanced study of the theory and practice of quantitative analysis. Lectures and discussions, 3 hours. *Prerequisite: Chemistry* 140*b*. (3) II (Wagner)

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, 3 hours. *Prerequisite: Chemistry* 130*b*. (2 ea.) I, II (Barkenbus)

232—STEREOISOMERISM OF CARBON COMPOUNDS. Optical isomerism; polarimetry; sterochemistry of biphenyls and related compounds; cistrans isomerism; and stereochemistry of the sugars. Lecture, 3 hours. *Prerequisite: Chemistry* 130*b*. (3) II (Smith)

234—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, 2 hours. *Prerequisites: Chemistry* 130 *b and* 140*b*. (2) I (Patterson)

238—PRINCIPLES OF ORGANIC CHEMISTRY. A general survey of the field of organic chemistry. Lecture, 4 hours. *Prerequisite: Chemistry* 130*b or equivalent*. (4) I (Barkenbus)

244—PHASE RULE. Lectures and assigned readings on the theory and applications of the phase rule. Lecture, 2 hours. *Prerequisite: Chemistry* 140*b*. (2) II (Sears)

246—CHEMICAL KINETICS. Studies of chemical reactions from the standpoint of velocity and mechanism. Lecture, three hours. *Prerequisite: Chemistry* 140*b*. (3) (Plucknett)

248—PRINCIPLES OF PHYSICAL CHEMISTRY. An advanced course dealing with the fundamental principles of physical chemistry. *Prerequisites: College physics, integral calculus, and one course in physical chemistry*. (4) I (Black)

288a-h—GRADUATE SEMINAR. Reports and discussions on recent research and current literature. Required of all graduate students. (1 ea.) I, II (Staff)

290a-l—RESEARCH IN CHEMISTRY. Work may be taken 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 ea.) I, II, S (Staff)

310—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, 2 hours. *Prerequisite: Chemistry* 110*b*. (2) II (Ames)

314—NON-AQUEOUS SOLUTIONS. A study of the properties of non-aqueous solutions and reactions in non-aqueous media. Lecture, 2 hours. *Prerequisite: Chemistry* 140*b*. (2) II (Sears)

322—ELECTRICAL METHODS OF ANALYSIS. The theory and application of potentiometric, polarographic, and conductometric measurements. Lecture, 1 hour; lab, 3 hours. *Prerequisites: Chemistry* 122 *and* 140*b*. (2) I (Wagner)

335—MOLECULAR REARRANGEMENTS. A study of the various mechanisms which have been proposed for reactions which produce change in the structural arrangement of the molecule. Lecture, 2 hours. *Prerequisite: Chemistry* 234. (2)

336—HETEROCYLIC COMPOUNDS. Occurrence, preparation, and properties of cyclic compounds containing oxygen, sulfur, and nitrogen. Lecture, 2 hours. *Prerequisite: Chemistry* 130*b*. (2) (Smith)

339a, b—TOPICS IN ORGANIC CHEMISTRY. Selected topics which may include heterocyclic organic compounds, natural and synthetic dyes, carbohydrates, nitrogen compounds, and other recent advances in the field of organic chemistry. Lecture, 2 hours. *Prerequisite: Chemistry* 130*b*. (2 ea.) I, II (Staff)

340—ELECTROCHEMISTRY. Modern theories of solutions. Applications of electrochemical methods in determining the properties of solutions. Polarization. Electrolysis. Equilibrium in solutions of electrolytes. Lecture, 3 hours. *Prerequisite: Chemistry* 140*b*. (3) I (Black)

341—QUANTUM CHEMISTRY. An introduction to quantum mechanics with emphasis on the aspects closely related to chemistry. *Prerequisites: Chemistry* 140*b and differential equations*. (2) (Drenan)

342—STATISTICAL THERMODYNAMICS. The study of chemical thermodynamics from the viewpoint of the statistical treatment of systems rather than from the classical approach. *Prerequisites: Chemistry* 141 *and differential equations*. (2) (Drenan)

349a, b—TOPICS IN PHYSICAL CHEMISTRY. Selected topics which may include photochemistry, structure of crystals, molecular spectra, and other recent advances in the field of physical chemistry. Lecture, 2 hours. *Prerequisites: Chemistry* 140*b and Mathematics* 105. (2 ea.)

DRAMATIC ARTS *(See English)*

DEPARTMENT OF ENGLISH, SPEECH, AND DRAMATIC ARTS

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

The Department offers the master's degree according to both Plan A and Plan B. (See pages 16-17.)

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

101—THE GRAMMAR OF STRUCTURE AND USAGE. Descriptive grammar for advanced students. Analysis of sentence structure; consideration of standards of usage; investigation of current practice. (3) II (Faust)

102—MODERN BRITISH AND AMERICAN ENGLISH. A survey of modern British and American English with respect to pronunciation, syntax, spelling, and usage. Historical developments will be examined insofar as doing so sheds light on modern practice. (3) I (Cutler)

104—MILTON. A study of all of Milton's poetry and of his more important prose; readings from contemporary thinkers; studies in thought currents of the time and Milton's relation to them. (3) II (Stroup)

105—CHAUCER. Extensive reading in the chief works of Chaucer with assigned problems relating to Chaucer and his age. (3) I (Cutler and Moore)

106a—ENGLISH ROMANTIC POETRY. The philosophical, critical, social, and political backgrounds of romanticism are examined. The emphasis is on Wordsworth, Coleridge, Byron, Shelley, and Keats. (3) I (Ward)

106b—ENGLISH ROMANTIC PROSE. The novel, the essay, and literary criticism are studied. Special attention is given to Lamb, Hazlitt, DeQuincey, Scott, and Jane Austen and to the critical prose of Wordsworth, Coleridge, and Shelley. (3) II (Ward)

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

107b—VICTORIAN PROSE. A study of Carlyle, Mill, Ruskin, Newman, Spencer, Arnold, Huxley, and related writers of the period in the field of prose. (3) II (Shine)

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

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

109—PRE-SHAKESPEARIAN DRAMA. A course in English origins, beginning with the Quem Quaeritis Trope and extending through the works of the early Elizabethans. (3) I (Stroup)

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

110b—SHAKESPEARE: THE TRAGEDIES. A continuation of English 110a, with special attention to the great tragedies. (3) II (Hatch and Black)

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

111b—THE VICTORIAN NOVEL IN ENGLAND. The course aims to acquaint the student with the development of the novel from Dickens through Gissing. (3) II (Knight)

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134--HISTORY OF THE STAGE. Designed to give th student a knowledge of dramatic history in relation to the problems of staging. Laboratory work is offer ed to acquaint the student with the present-day de- velopments of historic devices and techniques of staging. (3) I (Rhodes

137--STAGE PRODUCTIONS IN SCHOOL AND COMMUNITY. Designed for teachers and community theatre workers. The problems of staging under circumscribed condi- tions, minimum essentials of play production, and means of constructing or supplying these needs. (3) I, II (Briggs)

138--ADVANCED ORAL INTERPRETATION. The cuttin and adapting of three-act plays for oral presenta- tion. Prerequisite: English 38 or permission of instructor. (3) II (Sterrett)

143--EDGAR ALLAN POE. A comprehensive study of Poe's works, poetry, and prose. (3

145--ELIZABETHAN DRAMA, EXCLUSIVE OF SHAKE- SPEARE. A survey of English drama from the early Elizabethans until the closing of the theatre. (3) I (Stroup)

146a-DISCUSSION. The essentials of discussio with emphasis upon the thinking process as it oper ates in group situations. Participation in the various forms of discussion. (3) I (Blyto

146b-ADVANCED DISCUSSION. An intensive study of discussion as democracy in action. Ample time devoted to practice discussions. (3) I (Blyto

147--THE AGE OF JOHNSON. From 1740 to 1789. Johnson and his circle: Burke, Goldsmith, Gray, Walpole, Cowper, The Pre-Romantic movement. (3) I (Cooke)

148--A GENERAL INTRODUCTION TO FOLKLORE. An introduction--on a world-wide scope--to the types of folklore. Emphasis upon folklore as a cultural phenomenon in its own right and upon its relations to literary types. The development of the science of folklore. (3) I (Jansen)

149--AMERICAN FOLKLORE. A study of the major materials in American folklore. The use of this material in other forms. Experience in actual collecting and in the cataloging of materials. English 148 is not a prerequisite. (3) II (Jansen)

150--WORKSHOP IN SPEECH EDUCATION. Designed for advanced students, especially teachers and prospective teachers. Individual and group research projects pertaining to the teaching of speech. (6) II (Blyton)

152--THE AGE OF POPE. Addison and Steele, Swift, Pope, Defoe, and other contemporary figures. (3) II (Cooke)

153--THE DRAMA OF THE RESTORATION AND EIGHTEENTH CENTURY. A study of the dramatic types that arose between the closing of the theatres in 1642 and the death of Sheridan. (3) I (Cooke)

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155a-CONTEMPORARY AMERICAN POETRY. An examination of the forces which have modified poetry in England and America since 1830; and a study of the major modern poets. (3) II (Jacob

155b-CONTEMPORARY BRITISH POETRY. A continuation of English 155a, which is not prerequisite, although desirable. (3)

156a-THE MODERN AMERICAN NOVEL. Novels chose for their enduring value rather than historical importance; attention given to shifting techniques o fiction and to contrasting interpretations of the American scene. (3) I (Jacobs

156b-THE MODERN BRITISH NOVEL. A study of th content and technique of the best twentieth-centur British novels, with some consideration of these i relation to significant social, philosophical, an literary trends. (3

157--TEACHING OF SPEECH AND ORAL ENGLISH. A analysis of the field of speech education as rela to the teacher of speech. (3) II (Blyto

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

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159--PERSUASION. The principles and methods of persuasion. Of particular benefit to teachers, lawyers, business majors, and other persons whose work is concerned with motivating human conduct.
(3) I (Blyton)

160--THEORY AND TECHNIQUE OF ACTING. Development of skill and grace in the use of the body. Attention to establishing mood, reactions between characters, suspense through voice modulations, pause and other modes of emphasis, projecting voice and characterization.
(3) I (Briggs)

161--THEORY AND TECHNIQUE OF DIRECTING. Study of movement, interpretation of lines, creation of atmosphere, use of stage areas, use of levels, methods of achieving a climax, handling of groups, planning of mob scenes.
(3) II (Briggs)

162--THEORY AND TECHNIQUE OF THEATRE PRODUCTION. Application of modern aesthetic principles and theories of the theatre. Attention to coordination of the playwright, designer, technical director, electrician, stage manager, actor, etc.
(3) II (Rhodes)

163--SCENIC DESIGN. A study of form, line, and color as applied to the stage. Practical work in the building of model sets and in the application of these models to the major productions.
(3) I, II (Rhodes)

164--SPEECH COMPOSITION. A study of speech structure and its characteristic oral style. Both the analysis of contemporary speeches and the preparation of speech manuscripts. Prerequisite: English 6.
(3) I (Sterrett)

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

117a—WORKSHOP IN IMAGINATIVE WRITING. Chief attention will be directed to the short story, but time will also be given to the novel. Manuscripts will be analyzed, but primary attention will be given to the theory and conventions of fiction writing. *Prerequisite: English 1a, 1b, 2b and/or consent of instructor.* (2) I (Summers)

117b—WORKSHOP IN IMAGINATIVE WRITING. A continuation of English 117a. Emphasis on application of fictional techniques in student copy. Designed to bring about a fuller understanding of the conventions set forth in 117a and to bring practice closer to theory. *Prerequisite: English 117a and/or consent of instructor.* (2) II (Summers)

123a—AMERICAN LITERATURE BEFORE 1830. Beginning with the Transcendentalists, it studies the triumphant years of American romanticism, with especial attention to Emerson, Thoreau, Hawthorne, Melville, Poe, and Whitman. (3) I (Knight)

123b—AMERICAN LITERATURE AFTER 1830. 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)

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

124b—ENGLISH LITERATURE: 1600-1660. Selected non-dramatic works of such writers as Bacon, Donne, Ben Jonson, George Herbert, Izaak Walton, Herrick, Sir Thomas Browne, Vaughan, Traherne, and Milton. (3) II (Stroup)

127a—LITERATURE OF THE BIBLE. The Old Testament is studied as a post-exilic, edited body of literature. (3)

127b—LITERATURE OF THE BIBLE. The Wisdom Literature as humanistic. (3)

130a—COMPARATIVE LITERATURE. Extensive reading of literary masterpieces from Homer to Montaigne. The readings are in English translations, but a reading knowledge of at least one foreign language is desirable. (3) I (Brady)

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

131a-c—INDEPENDENT WORK. For advanced students of high standing. Each pursues a course independently, under the guidance of a staff member, writes a paper embodying the results of his study, and takes an examination. (3) I, II (Staff)

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

165—THE LYRIC IN ENGLISH. A course designed to trace the development of English lyrical poetry through close study of representative specimens, past and present. (3) II (Moore)

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

174—WRITING THE FULL-LENGTH PLAY. The writing of a full-length play is required during the semester. *Prerequisite: English 172.* (3) II (Robinson)

180—ENGLISH COMPOSITION AND LITERATURE FOR TEACHERS. The basic scholarly studies helpful to high school teachers of English. The teaching of grammar, punctuation, usage, etc.; of theme planning, correction, and revision; of reading factual and imaginative literature, with required explications. *Prerequisite: English 1a, 1b, 3a, 3b.* (3) II (Ward)

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

204—HISTORY OF THE ENGLISH LANGUAGE. A survey tracing the development of modern standard English from its Indo-European origin. Emphasis will be placed on the history of sounds, inflections, and vocabulary and the varying concepts of "correctness." (3) II (Cutler)

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

206a-d—SEMINAR: STUDIES IN THE ENGLISH ROMANTIC PERIOD. Studies to be centered upon one of the following: a particular author or small group of authors, a literary *genre*, or a literary movement during the Age of Wordsworth. (3 ea.) II (Ward)

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

212a-d—SEMINAR: STUDIES IN MEDIEVAL LITERATURE. Studies in Old English poetry and prose. Cynewulf, Beowulf, Alfred and his circle, Middle English, Chaucer. (3 ea.) II (Cutler and Moore)

213a-d—SEMINAR: STUDIES IN RESTORATION AND EIGHTEENTH CENTURY LITERATURE. Emphasis upon one: Johnson and his circle, Swift, the Romantic Revolt, the foreign relations of English Literature in the eighteenth century, or the theory and practice of Neoclassicism. (3) II (Cooke)

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

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

216a-d—SEMINAR: STUDIES IN AMERICAN LITERATURE BEFORE 1900. Studies to be centered upon one of the following: a particular author or a small group of authors, a literary *genre*, a literary movement, or a restricted period of time prior to 1900. (3 ea.) I, II (Spivey and Knight)

217a-d—SEMINAR: STUDIES IN CONTEMPORARY AMERICAN LITERATURE. Studies to be centered upon one of the following: a particular author or a small group of authors, a literary *genre*, a literary movement, or a restricted period of time subsequent to 1900. (3 ea.) I, II (Spivey and Knight)

224a-d—SEMINAR: STUDIES IN ENGLISH LITERATURE FROM 1500 TO 1660. A preliminary survey of the literary and cultural trends of the period is followed by directed research based upon the work of one writer, one group of writers, or one literary type. (3) II (Stroup)

500-1, 2, 3—THESIS. (0) I, II (Graduate Staff)

FRENCH *(See Modern Foreign Languages)*

GEOGRAPHY

100—REGIONAL GEOGRAPHY OF ANGLO-AMERICA. A regional study of natural resources, industries, and economic and social developments of the United States, Canada and Alaska. *Prerequisite: one geography course or permission of instructor.* (2) I, S (Jacobson)

101—GEOGRAPHY OF KENTUCKY. Emphasis upon problems involving the physical environment of Kentucky, human activities, distribution of population, and sequent occupance with special reference to regional and interregional adjustments. *Prerequisite: one geography course or permission of instructor.* (2) II, S (Schwendeman)

102—REGIONAL GEOGRAPHY OF LATIN AMERICA. Study of the countries and geographic regions of Mexico, Central America, and South America. Special reference will be made to inter-American relationships. *Prerequisite: one geography course or permission of instructor.* (2) I (Schwendeman)

103—REGIONAL GEOGRAPHY OF EUROPE. The European continent exclusive of the U.S.S.R. Discussion of environmental factors on a continental and regional basis. Population problems, economic adjustments, and political significance of resources. *Prerequisite: one geography course or permission of instructor.* (2) I (Shear)

104—REGIONAL GEOGRAPHY OF ASIA. A study of Asiatic countries and their geographic foundations. Major emphasis is given to the problems and development of the U.S.S.R., India, China, and Japan. *Prerequisite: one geography course or permission of instructor.* (2) II (Shear)

105—REGIONAL GEOGRAPHY OF AUSTRALIA AND THE PACIFIC ISLANDS. A study made of the geographic problems and adjustments of the peoples and countries of the Pacific area. *Prerequisite: one geography course or permission of instructor.* (2) II (Field)

106—REGIONAL GEOGRAPHY OF AFRICA. A study of African peoples, countries and colonies from the viewpoint of their adjustment to the natural regions. *Prerequisite: one geography course or permission of instructor.* (2) II (Field)

110—ADVANCED ECONOMIC GEOGRAPHY. A course to enable upper division students to carry on more detailed analyses of the various commodities and activities which contribute to national and international economic life. *Prerequisite: Geography* 10. (2) II (Jacobson)

112—CONSERVATION OF NATURAL RESOURCES. A study of the bases, needs and problems of conserving natural resources. *Prerequisite: Geography* 10 *or permission of instructor.* (2) II (Jacobson)

122—APPLIED CLIMATOLOGY. Studies involving the application of certain basic statistical techniques to the analysis of the climate of small regions. *Prerequisite:* 23 *equivalent.* (2) II (Shear)

130a, b—INTERMEDIATE FIELD STUDIES. An intensive study of a particular geographic area with emphasis on such specific skills as recording data for map compilation and report. *Prerequisites: Geog.* 1 *and* 134 *or* 136 *for Geography students, or permission of instructor for students offering field experience in allied subjects such as Geology.* (3 ea.) (Staff)

132a-d—INDEPENDENT WORK IN GEOGRAPHY. Individual research involving such problems as: (a) materials and methods in teaching geography; (b) the history and evolution of geography; (c) map reading and interpretation; (d) special area studies; other topics may be elected by consent of instructor. *Prerequisite: permission of instructor.* (3) I, II, S (Staff)

133a-k—SPECIAL PROBLEMS. 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. (Geography 133 can be elected only by students regularly enrolled in an upper division 2 credit course. (1 ea.) I, II, S (Staff)

134—CARTOGRAPHY. A course in the construction and interpretation of maps. (3) II (Field)

136—APPLIED CARTOGRAPHY. Map compilation techniques as directed by Army Map Service specifications. Enrollment by permission. (3) I (Field)

140—GEOGRAPHICAL FOUNDATIONS OF WORLD POWER. A study of the influence of location, size, form, surface, climate, and natural resources to national power. Consideration will be given to such modern theories as geopolitics. *Prerequisite: one geography course or permission of instructor.* (2) I (Schwendeman)

200a, b—REGIONAL STUDY OF SPECIAL AREAS. The application of the methods of regional interpretation to special areas such as the U.S.S.R., Mediterranean Basin, Caribbean Region, Mexico, Central Europe, etc. *Prerequisite: A prior major or minor in Geography.* (3 ea.) (Staff)

230a, b—ADVANCED FIELD STUDIES. Advanced field study and preparation of a report which shall include both manuscript and graphic material. *Prerequisites: Geog.* 1, 134 *or* 136, *and* 130 *for Geography students, or permission of instructor for students offering field experience in allied subjects such as Geology.* (3 ea.) (Staff)

500-1, 2, 3—THESIS. (0)

GEOLOGY

101a—PALEONTOLOGY. A study of fossil invertebrates, their nature, classification, and geological distribution. One lecture, four hours laboratory per week. *Prerequisites: Geology* 30*a, b; and general zoology or background in zoology.* (3) I (McFarlan)

101b—PALEONTOLOGY. The study of geological faunas. Practice in determining stratigraphic horizons. One lecture, four hours laboratory per week. *Prerequisite: Geology* 101*a.* (3) II (McFarlan)

105a-i—INDEPENDENT WORK IN GEOLOGY. Directed work in independent investigations. Thesis required. (3 ea.)

107a-f—ADVANCED FIELD GEOLOGY. A field course in geologic mapping involving problems of local structure and stratigraphy. Six hours a week in the field. *Prerequisites: Geology* 10*a, b.* (2) I, II (McFarlan and Nelson)

112—ECONOMIC GEOLOGY. Mineral deposits other than petroleum and natural gas. Distribution, mode of occurrence, origin, methods of search for, and uses. *Prerequisites: Geology* 30*a, b; and* 123*a, b.* (4) (Brown)

118a-d—FIELD WORK IN REGIONAL GEOLOGY. Eight weeks in the field in Colorado. The course is an effort to bring the student into contact with diverse geological phenomena and problems. Practice in geological field methods. See special announcement. Required of major students. *Prerequisites: Geology* 30*a, 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. (3) (McFarlan)

120b—GEOLOGY OF KENTUCKY. The mineral resources of the state, their distribution, origin, and uses. Fossil record. (3) (McFarlan)

123a—MINERALOGY. A study of geometrical crystallography and other physical properties useful in mineral identification. One lecture, four hours laboratory per week. *Prerequisites: Geology* 30*a, b; and Chem.* 1*a, b, or background in chemistry.* (3) I (Fisher)

123b—MINERALOGY. The determination of minerals by physical properties, blowpipe analysis, and the petrographic microscope. A study of the origin, occurrence, and associations. One lecture, four hours laboratory per week. *Prerequisite: Geology* 123*a.* (3) II (Fisher)

126a-d—SEMINAR. (1 ea.)

127—PETROLEUM GEOLOGY. The origin and accumulation of petroleum and natural gas. A study of geological methods used in exploratory work. Geology of the principal producing fields. *Prerequisites: Geology* 30*a, b; and general elementary physics.* (2) (Jacobsen)

129—ELEMENTARY PETROLOGY. A megascopic study of the common rocks with emphasis on the sedimentary rocks. (3) (Jacobsen)

130—ELEMENTARY STRUCTURAL GEOLOGY. An introduction to earth structures. Advanced geological map interpretation. (3) (Nelson)

208—STRUCTURAL GEOLOGY. A study of the structural features of the earth's crust with an analysis of the mechanics involved. Three lectures and recitations, or 2 lectures and one laboratory per week. *Prerequisites: Physics* 1*a, b; Geology* 30*a, b; and* 130. (3) (Nelson)

210a—STRATIGRAPHIC PALEONTOLOGY. Succession of faunas and the use of fossils for stratigraphic correlation. Lecture, 1 hour; laboratory, 4 hours. (3) I (McFarlan)

210b—STRATIGRAPHIC PALEONTOLOGY. A continuation of 210a. One lecture, four hours laboratory per week. (3) II (McFarlan)

212a—OPTICAL MINERALOGY. A study of the optical properties of minerals in thin sections by means of the petographic microscope. One lecture, four hours laboratory per week. *Prerequisites: Geology* 123*a, b; and Physics* 1*a, b.* (3) (Brown)

212b—SEDIMENTARY PETROLOGY. The classification and interpretation of sedimentary rocks with emphasis on those aspects which relate to the occurrence of Petrology. (4) (Jacobsen)

212c—PETROLOGY OF THE IGNEOUS ROCKS. The occurrence, origin and classification of igneous rocks. Identification with the petrographic microscope. An introduction to the metamorphic rocks. One lecture, four hours laboratory per week. *Prerequisites: Geology* 212*a.* (3) (Brown)

213—ADVANCED ECONOMIC GEOLOGY. Lecture, 2 hours; laboratory, 2 hours. (3) (Nelson)

217a-d—SEMINAR. (1 ea.)

500-1, 2, 3—THESIS. (0)

GERMAN *(See Modern Foreign Languages)*

GREEK *(See Ancient Languages)*

HEBREW *(See Ancient Languages)*

HISTORY

The Master's Degree with a Major 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 are essential. At least one course should be of the seminar type, with some training in method of graduate study.

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

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

The Doctorate with a Major in History

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

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

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

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

Area I. European History
- a. Ancient and Medieval
- b. Europe to 1789
- c. Europe since 1789

Area II. British History
- a. the history of England
- b. the British empire

Area III. American History
- a. American history to 1865
- b. American history since 1865

Area IV. Oriental History
- a. the Far East
- b. the Near East

Area V. Latin America

Area VI. Minor Subjects

I. American History

100a, b—THE DIPLOMACY AND FOREIGN POLICY OF THE UNITED STATES TO 1898. A survey designed to acquaint the student with the principles of American foreign policy. *Prerequisite: History 5a or equivalent.* (3) I (Hopkins)

105a—COLONIAL AMERICA. A study of the foundation of the English colonies; their political, social, and economic development; extension of their frontiers, inter-colonial wars, and external relations. *Prerequisite: one year of American or European history.* (3) II (Gilliam)

105b—THE AMERICAN REVOLUTION, 1763-1789. *Prerequisite: one year of American or European history.* (3) II (Taylor)

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

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

124a—SOCIAL AND CULTURAL HISTORY OF THE UNITED STATES TO 1830. This course deals with changing phases of social and cultural life in America. (3) I (England)

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

132—HISTORY OF AMERICAN AGRICULTURE. A survey of American agricultural history. (3) I, II (Wall, Hopkins)

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

141—TUTORIAL READING. (1) (Staff)

146—HISTORY OF THE UNITED STATES, 1877-1901. American history since the end of reconstruction to the turn of the century. (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, Wall)

151a—THE AMERICAN FRONTIER. A course dealing specifically with American expansion westward from the original colonies. *Prerequisites: History 5a, b or equivalents.* (3) I (Clark, Eaton)

151b—THE AMERICAN FRONTIER. A continuation of 151a. It will consider the Trans-Mississippi West. *Prerequisites: as for History 151a.* (3) II (Clark, Eaton)

180a—HISTORY OF THE OLD SOUTH. A study of the colonial beginnings and expansion of southern life, economics, and society. *Prerequisite: History 5a or equivalent.* (3) I (Eaton, Kirwan)

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, Kirwan)

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. (3) I (Cone)

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

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

135a—THE BRITISH EMPIRE TO 1860. Review of the various elements affecting Great Britain and its Empire between 1783 and 1860. (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. (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

110—POLITICAL AND ECONOMIC HISTORY OF MEDIEVAL EUROPE. A study of the institutional development of medieval Europe. Special emphasis will be placed on those political, economic and constitutional aspects of the growth of medieval states. (3) I (Staff)

111—MEDIEVAL CIVILIZATION. A topical study of the main currents of medieval social and cultural life. The chief emphasis will be placed on the "High Middle Ages" of the twelfth and thirteenth centuries. (3) II (Staff)

114—THE RENAISSANCE AND REFORMATION. The course is designed for a study of the birth of modern spirit and institutions. *Prerequisite: History 8a or 4a.*

118—SOCIAL HISTORY OF EUROPE IN THE EIGHTEENTH CENTURY. A study of the life and manners of the people of Europe in the 1700's. Especial attention will be given to Western and Southern Europe. *Prerequisite: History 4a and 4b or 8a and 8b.* (3) II (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. (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. (3) II (Lunde, Kraehe)

120—THE TWENTIETH CENTURY. A study of recent and contemporary movements, chiefly in Europe. (3) I (Kraehe)

145—RUSSIA SINCE 1900. This course will trace the development of Russia through the revolutionary upheavals of the present century, to a proletarian and industrial state under the soviet regime. (3) II (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. *Prerequisite: History 4a or its equivalent.* (3) II (Lunde)

179—MODERN EUROPE. This course is offered to meet a demand for a broad course which will equip students who are going out to teach European history in the present high school curriculum. *Prerequisites: History 4a and 4b.* (3) (Kraehe)

185a—CULTURAL HISTORY OF SEVENTEENTH CENTURY EUROPE. A history of the development of culture in various fields. Intended, without serious duplication of content of other courses, to furnish a background for further study in a number of directions. (3) I (McCloy)

185b—CULTURAL HISTORY OF EIGHTEENTH CENTURY EUROPE. This course is designed to give a survey of European culture during the 1700's, treating the sciences, literature, history, philosophy, the fine arts, and the industrial arts. (3) II (McCloy)

IV. The Far East

190a—THE FAR EAST TO 1900. The Portuguese, Dutch, French, and British colonial and trading empires in the Central East (India, Burma, Indo-China and the East Indies). *Prerequisite: History 8a or equivalent.* (2) I (Vandenbosch)

190b—THE FAR EAST SINCE 1900. The contacts of Europe and America with the Far East (China, Japan, Korea, and the Philippines) in the 19th and 20th centuries. *Prerequisite: History 8b or equivalent.* (2) II (Vandenbosch)

194—THE UNITED STATES IN THE PACIFIC AND THE FAR EAST SINCE 1898. This course presents the policies which resulted in annexation of Hawaii and the Philippines, the announcement of the so-called open door policies and the integrity of China, with their historic development. (2) I (Vandenbosch)

Courses in the "200" Group

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

202—THE AMERICAN REVOLUTION. Seminar. (3) II (Gilliam)

206—THE CONFEDERATION OF THE U. S. (3) (Eaton)

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

280—EUROPEAN HISTORIOGRAPHY. (3) I (McCloy)

281—AMERICAN HISTORIOGRAPHY. (3) I (Clark, England)

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 DIPLOMACY. (3) I (Hopkins)

315a-d—HENRY CLAY (AND HIS TIMES). (3) (Clark, Eaton)

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. Seminar. (3) (Eaton, Kirwan)

366—RECONSTRUCTION. (3) (Eaton, Kirwan)

European Group

320a-d—ORIGINS OF THE GREAT WAR. Seminar. (3) II (Kraehe)

331—SEMINAR IN MODERN BRITISH HISTORY. (3) II (Cone)

350a-d—SEMINAR IN THE FRENCH REVOLUTION. (3) (McCloy)

HISTORY OF EDUCATION *(See Education—Foundations of)*

HYGIENE AND PUBLIC HEALTH

100a—PUBLIC HEALTH. A consideration of environmental sanitation and its relationship to the control of preventable diseases. (3) I, S (Hamilton)

100b—PUBLIC HEALTH. A survey of the various fields of public health administration for official and voluntary agencies. (3) II, S (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. (3) II, S (Heinz)

111a-f—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. *Prerequisite: Bact. 52 or equivalent.* (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

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

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

200—EPIDEMIOLOGY. A survey of the principles and methods of epidemiology. (3) I, II, S (Hamilton)

203—PUBLIC HEALTH RECORDS. (2) I, II, S (Staff)

204—MATERNAL AND CHILD HEALTH. A study of the principles of maternal, prenatal, infant and child care. (2) I, S (Heinz)

212a—PUBLIC HEALTH ADMINISTRATION. A consideration of the principles of public health administration. (3) I, S (Heinz)

212b—PUBLIC HEALTH ADMINISTRATION. A continuation of Hygiene 212a. (2) II (Heinz)

218a—VITAL STATISTICS. Application of the statistics of population, births, deaths, etc. in Public Health. (3) I, S (Heinz)

218b—VITAL STATISTICS. A continuation of Hygiene 218a. (2) II, S (Staff)

225a—COUNTY HEALTH PRACTICE. (3) I, II, S (Staff)

225b—COUNTY HEALTH PRACTICE. (2) I, II, S (Staff)

290—SEMINAR. (1) I, II, S (Staff)

500-1, 2, 3—THESIS. (0) (Staff)

JOURNALISM

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

100a—NEWS REPORTING. Instruction and practice in news gathering, news evaluation, and news writing. *Prerequisite: Journalism 22.* (3) I, II (McCauley)

100b—NEWS REPORTING. A continuation of Journalism 100a with emphasis on special fields of information. *Prerequisite: Journalism 100a.* (3) I, II, S (Plummer)

101—COPYREADING AND EDITING. Instruction and practice in newspaper desk work. Preparation of local, state, telegraph, and features; picture editing, and page make-up. Laboratory, 6 hours. *Prerequisite: Journalism 100a.* (3) I, II (McCauley)

102—COMMUNITY JOURNALISM. A study of the problems which confront the community weekly and the small city daily. (3) I, S (Portmann)

103—NEWSPAPER ADMINISTRATION. A study of the business, circulation, advertising, and accounting divisions of the newspaper with special emphasis on the community newspapers. (3) II (Portmann)

105—LAW OF THE PRESS. A study of the special laws of libel, copyright, and regulatory provisions that pertain to the press. (2) II, S (Plummer)

106—INFLUENCE OF THE NEWSPAPER. A course devoted to the examination and criticism of the modern press and an evaluation of the influence of the press in the twentieth century. *Prerequisite: permission of the School.* (3) I, II, S (Moore)

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

108—HISTORY OF JOURNALISM. A study of the rise and development of American journalism and newspapers. *Prerequisite: permission of School.* (3) II (Portmann)

109—TYPOGRAPHY. Instruction and practice in typographic composition. Use of type faces in news editing. Study of typography in the make-up of American newspapers. Laboratory, four hours. (2) I, II (Portmann)

110—SUPERVISION OF HIGH SCHOOL PUBLICATIONS. A study of the problems that confront the adviser of the high school newspaper or magazine. Open to advisers or prospective advisers with consent of the instructor. (3) S (Portmann)

111—VERBAL CRITICISM. A study of words and their synonyms with reference to developing accuracy in use of the English language in journalistic work. (3) I, II, S (McCauley)

112—CRITICAL WRITING FOR THE PRESS. The function of criticism in journalism. Reviewing of motion pictures, plays, concerts, and books for newspapers with emphasis upon student work in Kentucky newspapers. (3)

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—PUBLIC RELATIONS. 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 (McCauley)

120—SEMINAR IN PUBLIC OPINION. A detailed examination of techniques developed and used by the press in influencing public opinion. Specific cases studied. *Prerequisite: permission of School.* (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. *Prerequisite: permission of School.* (3) I, II (Moore)

125—MAGAZINE ARTICLE WRITING. Lectures, personal conferences and practice in writing and submitting material for publication in magazines; study of the markets for this material; free-lance article writing. *Prerequisite: permission of School.* (3) II, S (Moore)

127—REPORTING PUBLIC AFFAIRS. Instruction and practice in reporting the news originating in courts and other public institutions. *Prerequisites: Journalism* 100*b and permission of School.* (3) II (McCauley)

130—INTRODUCTION TO PRESS PHOTOGRAPHY. Use of cameras, printers, enlargers and laboratory equipment in modern press photography, and a study of selected readings on photographic methods and skills. (3) I, II, S (Moore)

150—RADIO NEWS SCRIPTS. Instruction and practice in writing news and features material for radio presentation. *Prerequisite: Journalism* 22. (2) I, II (Moore)

LATIN *(See Ancient Languages)*

LIBRARY SCIENCE

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

The Department offers the master's degree according to Plan A and the professional degree of Master of Science in Library Science. (See pages 16, 18.) Nine hours of library science (L. S. 110 or 121 and L. S. 133a and 145 or their equivalent) are prerequisite to courses counted toward the 24 and 30 hours required in the master's degree programs. With the consent of the Head of the Department these prerequisite hours may be taken concurrently with graduate course work.

101a-d—INDEPENDENT WORK. Conferences, assigned readings, reports, etc. *Prerequisites: L. S.* 129, 133*a*, 145, 152, *and either* 110 *or* 121. (1 ea.) I, II, S (Staff)

110—THE LIBRARY IN THE SCHOOL. A study of the school library as a functioning organization. (3) I, S (Wofford)

121—LIBRARIES AND LIBRARIANSHIP. An orientation course designed to give students a general understanding of libraries and library work. (3) I, S (Martin)

127a—BOOKS AND RELATED MATERIALS FOR CHILDREN AND YOUNG PEOPLE. Designed for school librarians but open to students preparing to work with children and young people. (3) I, S (Wofford)

127b—BOOKS AND RELATED MATERIALS FOR CHILDREN AND YOUNG PEOPLE. A continuation of 127a. *Prerequisite: L. S. 127a.* (3) II, S (Wofford)

129—CATALOGING AND CLASSIFICATION. A study of the fundamental principles and methods of classification and cataloging books and related materials. (3) I, S (Lecky)

133a—REFERENCE AND BIBLIOGRAPHY. A study of the essential reference works, including dictionaries, encyclopedias, atlases, yearbooks, and periodical indexes. (3) I, S (Humeston)

133b—REFERENCE AND BIBLIOGRAPHY. A continuation of L. S. 133a. *Prerequisite: L. S. 133a.* (3) II, S (Lecky)

139—LIBRARY PRACTICE. Observation and supervised practice in a school library. This course fulfills a requirement of the Southern Association for school librarians. (3) I, II, S (Roser)

145—ORGANIZATION OF LIBRARY MATERIALS. A course designed to give the beginning librarian practical instruction in the acquisition and organization of library materials. (3) I, II, S (Wofford)

152—BOOK SELECTION. A general study of book selection principles and methods, with emphasis on printed materials as they interpret modern problems. (3) I, S (Humeston)

186—VISUAL TEACHING. A course in methods and techniques of visual instruction. Emphasis is on the effective use of films, film strips, pictures, maps, graphs, slides, field trips, by means of lesson plans. Surveys are made of visual materials. (3) I, II, S

187—NONBOOK MATERIALS. Selection, organization, and use of nonbook materials in various types of libraries. (3) II, S (Lecky)

212—THE PUBLIC LIBRARY. A study of the public library as a functioning institution. (2) I, S (Martin)

214—THE COLLEGE AND UNIVERSITY LIBRARY. A study of the college and university library as a functioning institution. (2) I, II, S (Hueston)

227—PROBLEMS IN READING FOR CHILDREN AND YOUNG PEOPLE. Considers reading interests and needs of younger readers, especially the retarded and superior, as well as studies in the field. *Prerequisites: L. S. 127a, b or equivalent.* (2) II, S (Wofford)

229—ADVANCED CATALOGING AND CLASSIFICATION. Expansion of the principles and methods of classification and cataloging books and related materials. *Prerequisite: L. S. 129 or equivalent.* (3) II, S (Lecky)

232—LIBRARY WORK WITH CHILDREN. A study of the origin and present status of library work with children in school and public libraries. (3) I, S (Martin)

235—GOVERNMENT PUBLICATIONS. A study of the problems of acquisition, preparation and use of United States federal, state, and local government publications. *Prerequisites: L. S. 133a, b, or equivalent.* (2) II (Lecky)

242—HISTORY OF BOOKS. This course considers the records of early man, invention of the alphabet, early writing materials, manuscript books; the invention of printing, and book production in modern times. (2) I, S (Lecky)

250—ADULT READING GUIDANCE. Survey of the significant published studies of adult reading, as a guide book selection through knowledge of adult needs and interests. (3) II, S (Martin)

252—ADVANCED BOOK SELECTION. Emphasis on the more imaginative and creative forms of literature, especially the place of fiction in the modern public library. *Prerequisite: L. S. 152 or equivalent.* (3) II, S (Martin)

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

MATHEMATICS AND ASTRONOMY

Graduate students will be able to obtain sufficient work to qualify for the doctor's degree. Twelve semester hours beyond integral calculus are required before counting work toward an advanced degree.

101a-f—INDEPENDENT WORK IN MATHEMATICS. Reading courses for upper division and graduate students. *Prerequisite: consent of the Department.* (3 ea.) (Staff)

102—VECTOR ANALYSIS. Contents: the algebra and calculus of vectors; applications to geometry, electricity, and physics; harmonic functions and potentials. *Prerequisite: M. and A. 20b.* (3) Cowling

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: M. and A. 20a.* (3) (Downing, Ward)

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: M. and A. 20b.* (3) I, II, S (Leser)

105b—DIFFERENTIAL EQUATIONS. Further study of ordinary differential equations, special types, singular solutions, and integration in series. *Prerequisite: M. and A. 105a.* (3) (Leser)

106a, b—ADVANCED CALCULUS. Continuous functions, differentiable functions, infinite series, implicit functions, Riemann integral, the gamma and beta functions, line surface and space integrals. *Prerequisite: M. and A. 25 or equivalent.* (3 ea.) (Downing or Cowling)

107—PROJECTIVE GEOMETRY. Contents: harmonic forms, projectively related primitive forms, curves and pencils of rays of second order, ruled surfaces of second order, theory of poles and polars, involution, inversion. *Prerequisite: consent of instructor.* (3) (Pence)

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: M. and A. 20b.* (3) (Leser)

118—SOLID ANALYTIC GEOMETRY. Contents: Systems of planes, plane coordinates, the concept of infinity, transformation of coordinates, types of surfaces, quadric, tetrahedral coordinates. *Prerequisite: M .and A. 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 instructor.* (3) (Pence)

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: M. and A. 25.* (3) (Cowling)

122—ACTUARIAL MATHEMATICS. Theory of mortality tables, life annuities, premiums, terminal reserves, joint-life annuities and insurances. *Prerequisite: M. and A. 20b.* (3)

123—CURVE TRACING. A study of various methods for sketching algebraic curves. Emphasis on the analytic polygon in finding approximations to the forms of the curve in the finite portion of the plane and at infinity. *Prerequisite: consent of instructor.* (3) I (Pence)

126—INTRODUCTION TO HIGHER ALGEBRA. Integral domains, fields, rings, polynomials, groups, vector spaces, matrices. *Prerequisite: M. and A. 26, or consent of the instructor.* (3) (Ward)

127a, b—INTRODUCTION TO HIGHER GEOMETRY. Emphasis on fundamentals common to all geometry. Geometries associated with the projective group and the group of circular transformations. *Prerequisite: M. and A. 27 or its equivalent.* (3, 3) (Pence)

128a—THE OPERATIONAL CALCULUS. The introductory theory and properties of the Laplace Transformation. Applications in differential equations, difference equations and boundary value problems of mechanics, electricity and heat. *Prerequisite: M. and A. 35.* (3) (Leser)

128b—THE OPERATIONAL CALCULUS. The theory of the inverse Laplace Transformation. Applications in advanced boundary value problems. Fourier Transforms and applications. *Prerequisite: M. and A. 128a.* (3) (Leser)

129—PROBABILITY. Theorems of total and compound probability, Bernoulli's Theorem, Bayes' Theorem, Poisson Law, Expected value, Law of large numbers. Distribution functions and characteristic functions. *Prerequisite: M. and A. 25.* (3)

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: M. and A. 25.* (3) (Eaves)

141—INTRODUCTION TO THEORY OF NUMBERS. Divisibility, prime numbers, congruences and residues, Diophantine equations. *Prerequisite: content of instructor.* (3) (Ward)

144a-f—PROBLEM SEMINAR. Reports on current research papers. Problems from various fields of mathematics. *Prerequisite: consent of instructor.* (2 ea.) (Senior Staff)

146—ALGEBRAIC METHODS IN ENGINEERING. Study of number systems, matrices, determinants, and Boolean Algebra with applications to electrical networks, machine computation, and other engineering problems. *Prerequisite: M. and A. 20b.* (3) (Ward)

201a-f—INDEPENDENT WORK IN MATHEMATICS. Reading courses in the 200 group for graduate students. (3 ea.) (Senior Staff)

202a, b—ALGEBRAIC CURVES. Topics include general properties of algebraic curves, the theory of residuation, singular points, covariant curves, unicursal curves, systems of curves. *Prerequisite: M. and A. 127b.* (3) (Pence)

204a, b—CALCULUS OF VARIATIONS. The ordinary problem for the plane and space cases; the necessary conditions of Euler, Weierstrass, Legendre, and Jacobi. The parametric problem; the isoperimetric problem. Sufficiency conditions. *Prerequisite: M. and A. 105b.* (3) (Downing)

205—DIFFERENTIAL GEOMETRY. Metric differential geometry of curves and surfaces in 3 dimensional Euclidean space, developable surfaces, curvature, geodesics, mapping of surfaces, absolute geometry of a surface. *Prerequisite: consent of instructor.* (3) (Downing)

206—THEORY OF GROUPS. Permutation groups, isomorphisms, the group postulates, abstract groups, automorphisms, homomorphisms, quotient groups, Abelian groups, Galois groups. *Prerequisite: consent of instructor.* (3) (Ward)

207a, b—FUNCTIONS OF A COMPLEX VARIABLE. Differentiation and integration, contour integration, poles and residues, Taylor and Laurent series, conformal mapping, Riemann mapping theorem, Dirichlet problem, multiple-valued functions, Riemann surfaces, and applications. *Prerequisite: M. and A. 106b.* (3, 3) (Goodman)

208a, b—FUNCTIONS OF REAL VARIABLE. Brief discussion of real numbers; continuous functions, semi-continuous functions, functions of bounded variations; Stieltjes Integral, measure and integration. *Prerequisite: M. and A. 106b, or consent of instructor.* (3, 3) (Cowling)

209a-f—SELECTED TOPICS IN THE THEORY OF COMPLEX VARIABLES. Analytic continuation, functions with natural boundaries, gap theorems, over-convergence, entire functions, Dirichlet series. *Prerequisite: consent of instructor.* (3 ea.) (Goodman)

210—ADVANCED METHEMATICAL STATISTICS. Theory of sampling, the Chi-square distribution, testing statistical hypotheses. *Prerequisite: M. and A. 120.* (3)

212a, b—SUMMABLE INFINITE PROCESSES. Fundamental limit idea applied to infinite sequences, infinite series, infinite products, etc. Summability of Sesaro, Holder, Abel, Borel, and Leroy. *Prerequisite: M. and A. 106b, or consent of instructor.* (3, 3) (Cowling)

213—FOURIER SERIES. Expression of a general periodic function as a Fourier series, sufficient conditions for convergence, Fejer's theorem, applications. *Prerequisite: M. and A. 106b.* (3) (Eaves)

214—POTENTIAL FUNCTIONS. Topics considered: Attraction of bodies, Newtonian potential function, theorems of Green and Gauss, level surfaces, spherical harmonics. *Prerequisite: M. and A. 105b.* (3) (Leser)

220a, b—MATHEMATICS SEMINAR. (2, 2) (Senior Staff)

221—TENSOR ANALYSIS. Topics considered: the theory of tensors, quadratic, differential forms, Riemannian geometry, pseudo-Euclidean geometry. *Prerequisite: consent of instructor.* (3) (Cowling)

222—ORTHOGONAL SYSTEM OF FUNCTIONS. This course supplements 221. Eigen value problems for linear differential equations, systems of orthogonal functions, spherical harmonics, hypergeometric and related functions, completeness. *Prerequisite: 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) (Cowling)

226a, b—HIGHER ALGEBRA. Groups, rings, fields, extension fields, Galois theory, linear algebras, hypercomplex numbers, ideals. *Prerequisite: M. and A. 126, or consent of instructor.* (3, 3) (Ward)

227a, b—HIGHER GEOMETRY. Topics include: Projective spaces, groups of collineations, invariants and covariants, Cremona transformations, the plane cubic and quartic, space curves, the cubic surface. *Prerequisite: M. and A. 127b.* (3, 3) (Pence)

230—TOPOLOGY. Calculus of sets, metric and separable spaces, complete spaces, continuous mapping, simply connected domains, accessibility and Jordan domains. *Prerequisite: M. and A. 106b, or consent of instructor.* (3) (Goodman)

231—ADVANCED DIFFERENTIAL EQUATIONS. Existence theorems, partial differential equations, linear equations with periodic coefficients, classical equations, equations in infinitely many variables. *Prerequisite: M. and A. 105b.* (3)

241—NUMBER THEORY. Peano's Axioms, continued fractions, quadratic fields, algebraic integers, p-adic numbers, etc. *Prerequisites: M. and A. 126 and 141.* (3) (Ward)

500-1, 2, 3—THESIS. This course is designed for graduate students working for advanced degrees. The time-credit is on the same basis as for any other course but no point credit is given. (0) (Senior Staff)

Astronomy

251a—CELESTIAL MECHANICS. Topics included: rectilinear motion, central forces, potential and attraction of bodies, and the problem of two bodies. *Prerequisite: M. and A. 105a.* (3)

251b—CELESTIAL MECHANICS. Orbit computation, the problem of three bodies and perturbations. *Prerequisite: M. and A. 251a.* (3)

DEPARTMENT OF MODERN FOREIGN LANGUAGES AND LITERATURES

The Department of Modern Foreign Languages and Literatures requires, as a prerequisite to candidacy for the master's degree, attainment in the language of specialization equivalent to that required for an undergraduate major in that language. The number of language courses required for the M.A. degree varies, depending in part upon the advanced courses which the student may be asked, or permitted to take in related departments.

French

101a, b—ADVANCED PHONETICS. This course is especially planned for teachers of phonetics both in high school and in college. (3, 3) I, II, S (Schick)

102a—FRENCH LITERATURE OF THE NINETEENTH CENTURY. A study of French Romanticism. Lectures and reading. (3) I, II, S (Walker)

102b—FRENCH LITERATURE OF THE NINETEENTH CENTURY. A study of Realism and Naturalism in France. Lectures and reading. (3) I, II, S (Walker)

103a—FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. A study of the literature of this period, not including Moliere, Corneille and Racine. (3) I, II, S (Ryland)

103b—FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. The plays of Molière, Corneille and Racine. (3) I, II, S (Ryland)

104a, b—ADVANCED FRENCH GRAMMAR. A study of the finer points of French grammar. (3, 3) I, II, S (Schick)

105a, b—FRENCH LITERATURE OF THE XVIII CENTURY. A study of the representative writers of the XVIII century, with special attention given to Voltaire and Rousseau. (3, 3) I, II, S (Walker)

106a, b—FRENCH LITERATURE OF THE XX CENTURY. A study of the modern writers starting with the Symbolist Group and continuing up to the present. (3, 3) I, II, S (Schick)

107a, b—ADVANCED FRENCH CONVERSATION. A study of intonation and elocution in French. Three minute speeches in French will be prepared for each recitation. Some reading in French poetry will also be practiced. (2, 2) I, II, S (Ryland)

180a-d—INDEPENDENT WORK IN FRENCH. (3 ea.) I, II, S (Staff)

191a, b—TUTORIAL SEMINAR FOR MAJORS IN THE ROMANCE LANGUAGES. A survey of French literature from 1600 to the present. Required of all Majors in French during the senior year. (1, 1) I, II (Ryland)

193—THE TEACHING OF ROMANCE LANGUAGES. A course for teachers and prospective teachers of Spanish or French, with the objective of providing a more vital approach to the teaching of these languages. (3) S (Server)

201a, b—FRENCH LITERATURE OF THE RENAISSANCE. A course starting with François Villon and including such writers as Marot, Rabelais, Calvin, Montaigne, Ronsard, DuBellay, Belleau and Regnier. To be given in French. (3, 3) I, II, S (Ryland)

202a, b—OLD FRENCH. (First semester) a study of the syntax and composition of old French. (Second semester) reading of texts in old French. (3, 3) I, II, S (Rea)

203a, b—SEMINAR IN FRENCH LITERATURE. (3, 3) I, II, S (Staff)

291a, b—ROMANCE PHILOLOGY. Study of the historical development of the various Romance languages with reading of texts chiefly from the medieval period. Special attention will be given to historical phonology and morphology. (3, 3) I, II, S (Rea)

500-1, 2, 3—THESIS. (0) I, II, S (Staff)

German

121a-d—INDEPENDENT WORK IN GERMAN. This course is designed for students who wish to do advanced work in German on any subject. It is limited to majors in the Department. (3 ea.) I, II, S (Staff)

122a, b—ADVANCED SCIENTIFIC GERMAN. This course is designed 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. (3 ea.) I, II, S (Whitaker)

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

The purpose of the proseminar courses is threefold: (1) Study of a representative author and certain of his works in their relation to his period; (2) Acquaintance with basic works of the author; (3) Training in simple research projects and proper form in the writing of papers.

123–PROSEMINAR IN KLEIST. (3) I (Whitaker)
124–PROSEMINAR IN HAUPTMANN. (3) II (Bigge)
125–PROSEMINAR IN SCHILLER. (3) I (Hegeman)
126–PROSEMINAR IN GRILLPARZER. (3) II (Whitaker)
127–PROSEMINAR IN THOMAS MANN. (3) I (Bigge)
128–PROSEMINAR IN LESSING. (3) II (Hegeman)
129–PROSEMINAR IN HEBBEL. (3) I (Whitaker)
130–PROSEMINAR IN SUDERMANN. (3) II (Whitaker)

133a, b–LIFE AND WORKS OF GOETHE. This course follows the unfolding of Goethe's genius from his first lyrics through Faust. His principal literary works will be read and attention devoted to autobiographical material, letters and diaries. (3 ea.) I, II, S (Hegeman)

134–ORIGIN AND DEVELOPMENT OF THE GERMAN LANGUAGE. This course in Germanic Philology acquaints the student with the position of German in the European language group and traces the development of the language to the present. Special emphasis is given to the relationship of German and English words. (3) I, II (Staff)

135–INTRODUCTION TO MIDDLE HIGH GERMAN. This is a literary course with a necessary minimum of Middle High German grammar. Selections will be read from epic and lyric poetry of the period and reports will be given on assigned topics. (3) I, II (Staff)

136–ADVANCED GERMAN CONVERSATION AND COMPOSITION. This course is primarily for German majors, particularly those planning to teach. It involves intensive practice in the writing of German prose, with some review of German grammar. (3) I, II (Ubben)

221a–GERMAN DRAMA OF THE 19th CENTURY. This course is a study of the German Drama from Schiller's "Die Braut von Messina" to 1870. (3) I (Whitaker)

221b–THE GERMAN NOVELLE. This course traces the origin and development of the German Novelle from Goethe to Thomas Mann. (3) II (Whitaker)

222a, b–20th CENTURY GERMAN LITERATURE. Extensive readings, discussions and comprehensive reports on the leading literary minds and movements of this Century. (3 ea.) I, II (Bigge)

223–THE AGE OF GOETHE. A seminar devoted to the investigation of one or more topics in the literature and social development of German during the period 1750 to 1825. (3) I, II (Hegeman)

500-1, 2, 3–THESIS. (0) I, II, S (Staff)

Spanish

181a, b–ADVANCED SPANISH GRAMMAR AND COMPOSITION. A study of the finer points of Spanish grammar. (3, 3) I, II, S (Server)

182a, b–SPANISH LITERATURE OF THE XVII CENTURY. Selected literature of the Golden Age; Cervantes, the picaresque novel, leading dramatists. (3, 3) I, II, S (Hernández)

183a, b–SPANISH LITERATURE OF THE XX CENTURY. A study of the later works of the Generation of 1898 and representative works of recent writers. (3, 3) I, II, S (Server)

184a, b–SPANISH AMERICAN LITERATURE. A study of representative writers and principal literary productions of Spanish America. Outside reading of 2000 to 2500 pages of selected works. (3, 3) I, II, S (Server)

185a–SPANISH LITERATURE OF THE XIX CENTURY. A study of Spanish Romanticism and the works of the leading Constumbristas. (3) I, II, S (Server)

185b–SPANISH LITERATURE OF THE XIX CENTURY. A study of the novel and drama of the second half of the XIX Century. (3) I, II, S (Server)

186a-d–INDEPENDENT WORK IN SPANISH. (3 ea.) I, II, S (Staff)

191a, b–TUTORIAL SEMINAR FOR MAJORS IN THE ROMANCE LANGUAGES. A survey of Spanish literature from 1600 to the present. Required of all Majors in Spanish during the senior year. (1, 1) I, II (Server)

193–THE TEACHING OF ROMANCE LANGUAGES. A course for teachers and prospective teachers of Spanish or French, with the objective of providing a more vital approach to the teaching of these languages. (3) S (Server)

281a–OLD SPANISH. A study of the vocabulary and grammar of Old Spanish, contrasting and comparing it to modern Spanish. (3) I, II, S (Server)

281b–OLD SPANISH. Reading of texts in Old Spanish. (3) I, II, S (Server)

282a, b–SEMINAR IN SPANISH LITERATURE. (3, 3) I, II, S (Staff)

500-1, 2, 3–THESIS. (0) I, II, S (Staff)

MUSIC

The University offers the Master of Arts degree with a major in music, the Master of Music with a major in Applied Music or Music Education, and the Master of Arts in Education, with emphasis in the field of Music Education. Candidates for these degrees must present the reasonable equivalent of the University of Kentucky undergraduate requirements in music, appropriate to the prospective area of concentration on the Master's level.

Entrance Examinations—All candidates must qualify through examination in the proposed field of concentration, and in basic theory and music history. Any deficiencies must be removed before graduation. For the time and place of these examinations, consult the Music Department.

Foreign Language Requirements—The undergraduate record of Master of Music candidates must show credit for one year of foreign language study. In the event it does not, the candidate will be required to study one year of a foreign language as a graduate student. This credit will not apply toward the Master of Music degree. The Master of Arts with a major in music requires a reading knowledge of one foreign language, preferably French or German.

Thesis Requirements—The degrees Master of Arts and Master of Music with a major in Music Education require theses. A thesis is optional in the Master of Arts in Education curriculum. (See pages 91, 92.) A public recital in lieu of a thesis is required for the M.M. with a major in Applied Music.

Master of Music with a major in Applied Music

A minimum of twenty-four graduate hours.

Eight to twelve graduate hours in Applied Music.

In the event the student is not sufficiently prepared to do graduate work in Applied Music, or if there is a deficiency in repertoire, he must study without credit until fully prepared to do graduate work. Candidates in Applied Music, Voice, must have completed one year of study in each of two modern foreign languages.

Twelve to sixteen hours from at least two of the following: Music literature, music theory, music education, or non-music subjects.

A public recital of music major proportion passed upon by the music faculty and a comprehensive examination in the area of concentration.

Master of Music with a major in Music Education

A minimum of twenty-four graduate hours.

Eight to twelve hours in the field of music education.

Twelve to sixteen hours in two or more of the following areas: Music literature, music theory, applied music, education, other non-music courses.

A thesis, a written and oral comprehensive examination in the area of concentration.

Master of Arts in Education *(See pages 91, 92)*

Master of Arts with a major in Music

The usual area of concentration for this degree is in the field of music literature or theory of music.

102a, b—VOCAL PEDAGOGY. The study of physical and psychological problems in the teaching of voice production, the study of breath control, diction, resonance, interpretation, and repertoire. (2) I, II, S (Kiviniemi)

103a, b—PIANO PEDAGOGY. A study of teaching methods and materials. (1) I, II, S (Montgomery)

106a, b—PIANO LITERATURE. A survey of music written for the piano, emphasizing problems in performance of standard piano literature. (2) I, II, S (Patch)

107a, b—VOCAL LITERATURE. A study of the development of solo song literature. (2) I, II, S (Va. Lutz)

108a, b—HISTORY AND LITERATURE OF THE ORGAN. A study designed to give the student a practical knowledge of the development of the organ, its construction, the literature, and teaching materials. (2) I, II, S (Blackburn)

110—RESEARCH PROBLEMS IN PEDAGOGY OF THEORY. The methods and techniques of teaching musical theory. (2) I, S (Kinney, Wright)

113a, b—COUNTERPOINT. A study of Counterpoint based on the 16th Century and 18th Century contrapuntal techniques. Original compositions and analysis. *Prerequisites: Music* 51*a, b;* 52*a, b.* (2) I, II, S (Kinney, Wright)

115a, b—CHORAL CONDUCTING. A study of the fundamentals of choral conducting and choral literature, emphasizing materials for the secondary school level. (2) I, II, S (Lewis)

116a, b—INSTRUMENTAL CONDUCTING. The technique and practice of the fundamentals of instrumental conducting and score reading. (2) I, II (Rabin)

117a, b—ORCHESTRATION. This course includes a study of the individual instruments of the orchestra and band with practice in scoring for these instruments. (2) I, II, S

118—MARCHING BAND TECHNIQUE. Marching Band organization and formation planning, including practical instruction in the care and repair of instruments. (2) II, S

119a, b—COMPOSITION. A beginning course in original composition which affords the student opportunity to compose in the small forms. (2) I, II, S (Wright)

123—SURVEY OF CONTEMPORARY MUSIC. A stylistic study of representative compositions of the twentieth century. (2) I, S (Kinney)

124a, b, c—OPERA WORKSHOP. (1) S (Kiviniemi)

125—MUSIC EDUCATION WORKSHOP: CHORAL. An intensive study of choral literature and interpretation through lectures, demonstrations, and participation. (1) S (Hoggard, McConnell)

126—MUSIC EDUCATION WORKSHOP: GENERAL MUSIC. A study of elementary and secondary school methods and materials, class piano techniques, audio-visual aids in Music Education, and the administration of school music. (1) S (Lewis)

127—MUSIC EDUCATION WORKSHOP: THE SCHOOL ORCHESTRA. A study of school orchestra methods, materials, and administration, and specific stringed instrument teaching problems. This unit convenes during the annual meeting of the University of Kentucky Summer All-State High School Orchestra. (1) S (Lutz, Fitzgerald, Rush)

128—MUSIC EDUCATION WORKSHOP: THE SCHOOL BAND. A study of concert and marching band organization on the secondary school level, with brass, woodwind, percussion, and conducting clinics. (1) S (Lutz, Fitzgerald, Prindl)

145—SUPERVISION. Administrative problems in public school music. (2) II, S (Lewis)

200a, b, c—ADVANCED COMPOSITION AND ORCHESTRATION. *Prerequisite: Music* 119*a, b.* (2) (Wright)

203—CHORAL LITERATURE AND TECHNIQUE. An advanced interpretive study of major choral compositions. (2) I, S (Lewis)

204—ADVANCED BAND TECHNIQUE. An advanced course with concentration on band organization and materials, conducting, and band arranging. (2) II, S (Prindl)

205—MEDIEVAL AND RENAISSANCE MUSIC. An advanced study of the musical developments during these periods. (2) II, S (Stein)

206—SEVENTEENTH AND EIGHTEENTH CENTURY MUSIC. An advanced study of the music from the Baroque and Classical Periods. (2) I, S (Stein)

207—THE ROMANTIC MOVEMENT. An historical study of the Romantic Movement in music during the nineteenth century. (2) II, S (Stein)

214—ADVANCED CONDUCTING. Advanced studies in conducting techniques, score reading, and interpretation. *Prerequisite:* 116*a, b.* (2) II, S (Rabin)

215a-h—PIANO. (2) I, II, S (Montgomery, Patch)

216a-h—STRINGS. (2) I, II, S (Wright, Kinney)

217a-h—VOICE. (2) I, II, S (King, Kiviniemi, V. Lutz)

218a-h—ORGAN. (2) I, II, S (Blackburn)

220—RESEARCH METHODS. Studies in basic research techniques and materials in the field of music. (2) I, S (Stein)

224a, b—ADVANCED MUSICAL ANALYSIS. A course designed to show the changing aspects of musical style through analysis of representative compositions from all periods. (2) I, S (Wright)

231a-h—WOODWIND INSTRUMENTS. (2) I, II, S (Adams, W. Lutz, Stein)

232a-h—BRASS AND PERCUSSION INSTRUMENTS. (2) I, II, S (Prindl, Worrel)

MUSIC 242 and EDUCATION 242—ADMINISTRATION AND SUPERVISION OF PUBLIC SCHOOL MUSIC. Current trends in school music, curricula, testing programs, and other supervisory procedures. (3) II, S (Worrel)

MUSIC 243 and EDUCATION 243—ADVANCED METHODS AND MATERIALS IN EDUCATION. A survey and evaluation of new public school music methods and materials. (2) I, S (Worrel)

MUSIC 244 and EDUCATION 244—HISTORY AND PHILOSOPHY OF MUSIC EDUCATION. A survey of the historical developments and basic philosophies of public school music. (2) I, S (Worrel)

PHILOSOPHY

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

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

102—CONTEMPORARY PHILOSOPHY. A study of contemporary philosophic tendencies, notably neorealism, critical realism, critical monism, pragmatism, idealism, neoscholasticism, existentialism, and logical positivism. (3) I (Melzer)

106—REPRESENTATIVE MODERN PHILOSOPHIES. 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)

110—THE MAKING OF THE MODERN MIND. A study of the intellectual background of the modern age. Renaissance humanism, 17th and 18th century rationalism, 19th century romanticism and idealism are some of the major tendencies to be stressed. (3) (Kuiper)

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) (Melzer)

118—PLATO AND ARISTOTLE. Plato's development of a theory of the world and of practice, studies in selected dialogues. Analysis of passages in Aristotle's major works on natural philosophy, methaphysics, knowledge, ethics, and politics. (3) II (De Boer)

120—GREAT RELIGIONS. A descriptive survey of several religions as they developed within their culture, for example: Hinduism, Buddhism, Confucianism, Judaism, Christianity. (3) I, S (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 concepts of God, the soul, immortality; internal and external criticisms of religion. (3) I (Melzer)

130—METAPHYSICS. Study of concepts and problems important for understanding the general or ultimate factors in reality; e.g., space-time, change, causality, substance, matter, life, God. (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) II (Melzer)

153—AESTHETICS. Problems of method in aesthetics; major types of aesthetic theory. Aesthetic materials of the arts in literature, music, and the space arts. Form and types of form. Meaning in the arts. Interrelations of the arts. Lectures, discussions, reports. (Same as Art 153.) (3) I (Amyx)

160—PHILOSOPHY OF SCIENCE. An examination of the logical and epistemological foundations of empirical science, including such topics as the unity and diversity of the sciences, methodology, theory and explanation, and current studies in the language of science. *Prerequisite: Designed especially for undergraduate and graduate majors in the sciences. Permission of instructor to insure that the student will have an adequate background for the course.* (3) (Staff)

190—PROBLEMS OF PHILOSOPHY. This course is designed for upper division and graduate students who have had little or no formal training in philosophy but wish to study the presuppositions underlying religion, education, art, morality, and government. (3) (Staff)

201a-h—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: Whitehead and Russell, C. I. Lewis, 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)

PHYSICAL EDUCATION

The Department of Physical Education offers graduate work toward the Master of Arts or the Master of Science with a major in Physical Education. Candidates may select, subject to the approval of the Department of Physical Education, either of two plans in pursuing their graduate program.

Under Plan A the candidate must complete 24 semester hours of graduate courses with a standing of 3.0 ("B") or better. A minimum of 9 of these hours must be in Physical Education courses numbered "200" or above. The candidate shall complete at least two-thirds of this course work in the field of Physical Education and the other third may be taken in the second teaching area or in the field of Physical Education. The minimum residence required is one academic year of 36 weeks. A thesis and a reading knowledge of a modern foreign language complete the requirements under Plan A.

The modified Plan B has the same minimum requirements as Plan A except that six or more semester hours of course work may be substituted for a thesis and a reading knowledge of a modern foreign language is not required of candidates in the Department of Physical Education. Of the thirty hours of graduate credit indicated above in the modified Plan B, eight hours must be in a subject-matter area other than Physical Education and Education. At least 12 hours must be in "200" courses in Physical Education. A student may follow this plan only with approval of the Department of Physical Education.

Courses For Men and Women Open to Upper Division and Graduate Students

140—ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION. Policies and procedures of administration on the secondary school and collegiate levels. Special emphasis on construction and care of facilities, equipment and supervision of personnel. Three hours per week. (3) I, S—odd years (Clay, Carr)

141—COACHING ADVANCED BASKETBALL. Lecture and recitation on the theory and practice of team play in basketball. Special emphasis is placed upon systems of offense and defense as used by the leading coaches throughout the country. Two hours per week. *Prerequisite: Physical Education* 41. (2) I, S (Rupp, Clay)

142—COACHING ADVANCED FOOTBALL. Lecture and recitation on the theory of football. Special emphasis is placed on generalship, signal systems, scouting and conditioning of players. Leading football systems are studied. Two hours per week. *Prerequisite: Physical Education* 42 *or permission of instructor.* (2) II, S (Collier, McCubbin)

143—HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION. Study of the historical development of physical education and an interpretation of the biological, psychological and sociological principles of physical education. Three hours per week. (3) II, S (Hackensmith, Carr)

144—PHYSICAL EDUCATION IN THE SECONDARY SCHOOL. Required for teacher certification in physical education. Study of theory, practice, and methods of teaching physical education activities and supervising programs in the secondary school. Three hours per week of lecture, recitation, and visitation. (3) II, S (Carr, Clay)

145—INTRODUCTION TO TESTS AND MEASUREMENTS. The construction and grading of essay and objective tests; construction and analysis of achievement tests; and testing and measuring in health and physical education. Two hours lecture and two hours laboratory per week. (3) II (Hackensmith)

158a—SPORTS OFFICIATING FOR MEN. The theory and practice of officiating football, volleyball, basketball, swimming, and other sports. Officiating in college intramurals and high school athletics will be required. One hour lecture, two laboratory. (1) I, S (Johnson)

158b—SPORTS OFFICIATING FOR MEN. The theory and practice of officiating basketball, track, baseball, tennis, and other sports. Officiating in college intramurals and high school athletics will be required. One hour lecture, two hours laboratory. (1) II, S (Johnson)

159a—SPORTS OFFICIATING FOR WOMEN. Instruction, interpretation of rules and practice in officiating field hockey, volleyball, basketball, and other sports. Preparation for Women's National Officials rating in athletics. One hour lecture, two hours laboratory. (1) I, S (Carr)

159b—SPORTS OFFICIATING FOR WOMEN. Instruction, interpretation of rules and practice in officiating basketball, softball, tennis, and other sports. Preparation for Women's National Officials rating in athletics. One hour lecture, two hours laboratory. (1) II, S (Carr)

165—SAFETY IN PHYSICAL EDUCATION. Designed to prepare majors to teach safety education or to serve as a school safety coordinator. Provides a knowledge of all common areas of safety education but emphasizes safety in athletics, physical education and recreation. (2) I, S—even years (Seaton)

169a, b—STUDENT TEACHING IN PHYSICAL EDUCATION. See Secondary Education, College of Education. (9) I, II (Gilb, Clay, Ginger, Seaton)

172—KINESIOLOGY. Study of muscular and mechanical factors in bodily movements. Three hours lecture per week. *Prerequisites: Anatomy and Physiology 4 and 5.* (3) I, S—odd years (Staff)

173—REMEDIAL PHYSICAL EDUCATION. A study of the prevention and treatment of physical defects. Two hours lecture and two hours practice per week. *Prerequisite: Physical Education* 172. (3) II, S—even years (Staff)

174—TECHNIQUES OF REHABILITATION. A practical course in rehabilitation techniques employed in hospitals and rehabilitation centers. Four hours laboratory per week. *Prerequisite: Physical Education* 173 *or permission of instructor.* (2) I (Staff)

175—FIELD WORK IN REHABILITATION. A course involving clinical practice in therapeutic exercise under medical supervision. Designed to qualify students as Exercise Therapists and to prepare those entering allied fields of rehabilitation. One hour lecture and four hours laboratory per week. *Prerequisite: Physical Education* 173, *or permission of instructor.* (3) II (Staff)

180—ADMINISTRATION AND ORGANIZATION OF RECREATION. This course is designed to equip students and community leaders with workable procedures for developing and operating recreation programs in communities of various sizes and with varying political and social structures. (3) II, S (Kauffman)

181—CAMPING IN EDUCATION. Purpose, history, organization, and conduct of camps of various types by educational institutions as an instrument for attaining the objectives of education. (2) I, S (Kauffman)

182—INTRAMURAL SPORTS. A study of the history and development of intramural sports. Lecture, recitation, and practice in accepted methods of organizing and administering intramural sports. One hour lecture and two hours laboratory. (1) II, S—even years (McCubbin, Staff)

183—INTERPRETATIONS OF LEISURE AND RECREATION. Designed to provide students interested in recreation as a profession, as an adjunct to other work, or as informed citizens with a basic understanding of the significance of leisure and the objectives of recreation. (3) I, S (Kauffman)

185—COMMERCIAL RECREATION. Consideration of socio-economic aspects of commercial recreation and of the development of operational techniques. Designed for students and operators of commercial recreation facilities. *Prerequisite: Sociology* 40 *or permission of instructor.* (3) II, S (Kauffman)

190—HISTORY AND SURVEY OF DANCE. The study of the evolution of dance through the cultural periods of history and the correlation of social structure and dance forms. Open also to male students. Three hours per week. (3) II, S—odd years (Staff)

191—RHYTHMICAL FORM AND ANALYSIS. A functional study of rhythm presented in relation to movement. Open also to male students. One hour lecture and recitation, and two hours laboratory. (2) II (Stille)

192—DANCE COMPOSITION. Creative composing in dance choreography and program planning. Open to male students. Two hours lecture and recitation and four hours laboratory per week. *Prerequisite: Physical Education* 91. (4) I (Stille)

195—FOLK DANCE LEADERSHIP FOR SCHOOL AND COMMUNITY. Philosophy, background and methods of folk dance for schools and communities. Leadership, participation and program planning with special emphasis upon field work with community groups. One hour lecture and two hours laboratory. (2) S (Karsner, Lewis)

Courses Open to Graduate Students Only

240—SEMINAR. Required of all graduate students upon entrance. An orientation course required of graduate students with a major interest in physical education. Two hours lecture and recitation. (2) I, II, S (Carr, Hackensmith)

241—CURRENT STUDIES AND TRENDS. 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 IN PHYSICAL EDUCATION. Students work on individual problems applicable to their situation and interests, as well as upon general school problems. An attempt is made by the instructor to visit each student on the job and to provide guidance in his work. (3) I, S—odd years (Seaton)

243—PROBLEMS IN THE ADMINISTRATION OF ATHLETICS. For athletic directors, supervisors, and athletic coaches. A study of representative athletic administration procedures for colleges, public school systems, and municipal athletic leagues. Two hours per week. (2) II, S—even years (Clay)

244—RESEARCH AND ITS APPLICATION. The theory and practice of measurement of strength, size, maturity, power, motor educability, agility, and special abilities. Two hours lecture and two hours laboratory per week. (3) I, S (Hackensmith)

280—PROBLEMS IN RECREATION. Current problems in recreation are identified and analyzed by the application of appropriate research techniques. Designed recreationists, school people, and community workers. (2) I, S (Kauffman)

PHYSICS

The Department of Physics is well equipped with instruments of precision and has adequate laboratory and library facilities necessary to the proper conduct of the following list of advanced and graduate courses:

104—THEORETICAL MECHANICS. A lecture and problem course covering the fundamental laws of mechanics. Topics include kinematics of a particle, statics and dynamics of particles and rigid bodies, constrained motion, and oscillatory motion. *Prerequisites: Physics 3b and Mathematics 20b.* (4) (Kern)

108—LIGHT. A lecture and problem course covering the basic phenomena of optics. Topics include thick lenses, apertures, wave motion, interference, diffraction, polarization, and the theory of selected optical instruments. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Hanau)

110—SPECTROSCOPY. A lecture and problem course dealing with the production, recording, measuring, and interpretation of atomic and molecular spectra. Topics include basic principles of atomic structure, spectographs, photometry, and spectographic analysis. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Hanau)

111—ELECTRICITY AND MAGNETISM. A lecture and problem course dealing with the fundamental theory of electricity and magnetism. Topics include electrostatic forces and energy, conductors and dielectrics, magnetic forces, and transient and alternating currents. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Mockler)

114—VACUUM TUBES AND CIRCUIT THEORY. A lecture and problem course covering the theory of vacuum tubes and associated circuits. It includes the solution of selected electronic circuits by the method of the Laplace operator. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Staff)

115—THEORY OF MEASUREMENTS. A lecture and problem course in the analysis of experimental data. Topics include finding an empirical equation to fit a set of data, approximations, probability distributions, errors and deviations. *Prerequisites: Physics 104 and Mathematics 20b.* (3) (Staff)

119—X-RAYS AND CRYSTAL STRUCTURE. A lecture and problem course dealing with the production and properties of X-Rays. Topics include absorption, scattering, polarization, etc.; wave length measurement; the Compton effect and related quantum phenomena. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Staff)

120—X-RAY TECHNIQUE. An introductory lecture and laboratory course in X-Ray technique. The course deals with operation of X-ray equipment, and practice in the radiography of the extremities, chest, head, teeth, etc. *Prerequisite: Physics 1b.* (2) (Cochran)

123a—HEAT AND THERMODYNAMICS. A lecture and problem course stressing some of the fundamental principles of heat phenomena, the laws of thermodynamics, equations of state for ideal and real gases, continuity, derivation of thermodynamic relations. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Lamarsh)

123b—HEAT AND THERMODYNAMICS. A continuation of 123a, dealing with thermodynamic functions, thermodynamic equilibrium, the phase rule of phase equilibria, ionic equilibrium, electromotive force and free energy, surface phenomena, radiation. *Prerequisite: Physics 123a or equivalent.* (3) (Lamarsh)

125a-d—INDEPENDENT WORK IN PHYSICS. (3 ea.) (Staff)

130—EXPERIMENTAL PHYSICS; SPECTROSCOPY. An advanced laboratory course in the use and properties of various light sources, spectographs, photographic materials, and photometric methods; analysis of unknown materials by spectographic methods. *Prerequisite: Physics 110 or 108.* (2) (Hanau)

131—EXPERIMENTAL PHYSICS: ELECTRICITY AND MAGNETISM. An advanced laboratory course in electrical measurements. It includes calibration and use of the quadrant electrometer, the d'Arsonval galvanometer and the Type K Potentiometer; absolute determinations of electrical quantities. *Prerequisite or corequisite: Physics 111 or equivalent.* (2) (Cochran)

134—EXPERIMENTAL PHYSICS: VACUUM TUBES. An advanced laboratory course dealing with the measurements of circuit and vacuum tube constants, and the experimental study of amplifiers, oscillators, plus generators, saw-tooth generators, etc. *Prerequisite or concurrent: Physics 114 or equivalent.* (2) (Staff)

135—EXPERIMENTAL PHYSICS: ATOMICS AND NUCLEONICS. An advanced laboratory course dealing with the methods of detecting and studying nuclear particles. Measurements will be made on half-lives, absorption coefficients, ranges, particle energies. *Prerequisite or corequisite: Physics 155a or equivalent.* (2) (Cochran)

137—EXPERIMENTAL PHYSICS: HEAT. An advanced laboratory course in modern methods of measuring thermal quantities. Experiments include thermocouples, coefficients of expansion, vapor pressures, viscosity, surface tension, specific and latent heats, radiation constants. *Prerequisite or corequisite: Physics 123a or equivalent.* (2) (Koppius)

138—EXPERIMENTAL PHYSICS: LIGHT. An advanced laboratory course dealing with the properties of lenses, mirrors, prisms, gratings, and combinations of these elements in optical systems. The important phenomena of optics are studied experimentally. *Prerequisite: Physics* 108. (2) (Hanau)

155a—FUNDAMENTAL ATOMIC AND NUCLEAR PHYSICS. A lecture and problem course stressing the fundamental principles of atomic and nuclear theory. Topics: atomic nature of matter; atomic and molecular structure; general laws of radioactivity. *Prerequisites: Physics 3b and Mathematics 20b.* (3) (Hahn)

155b—FUNDAMENTAL ATOMIC AND NUCLEAR PHYSICS. A continuation of 155a in which a more detailed and more theoretical study of nuclear structure will be made. Topics: basic facts for nuclear theory, nuclear dynamics, and nuclear forces. *Prerequisite: Physics 155a.* (3) (Kern)

205—KINETIC THEORY OF MATTER. A course of lectures covering the classical kinetic theory of gases. Topics include the theorems of Clausius, Joule, Maxwell and Boltzmann; Brownian movements, development of equations of change of state. *Prerequisites: two "100" courses in physics and Mathematics 105a.* (3) (Staff)

206—METHODS OF MATHEMATICAL PHYSICS. Solution of physical problems systematized according to the equations they satisfy. Variational methods, boundary conditions, eigenfunctions, Green's functions, integral representations, approximation procedures, with applications from electromagnetic theory, quantum mechanics, acoustics. (3) (Lamarsh)

208—MICROWAVES. A lecture and problem course reviewing electromagnetic wave theory with emphasis on solutions of Maxwell's wave equations and their applications to the modern problems of microwave transmission. *Prerequisites: Physics* 111; *Mathematics* 105*a; and Electrical Engineering* 133 *or equivalent.* (3) (Staff)

212—CONDUCTION OF ELECTRICITY THROUGH GASES. A lecture course covering the basic phenomena of electrical discharge in gases at low pressures. Topics include the formation of ions, their mobility, diffusion, and recombination; representative discharges. *Prerequisites: Physics* 111, *and either* 110 *or* 155*a; and Mathematics* 105*a.* (3) (Hanau)

213—ELECTROMAGNETIC THEORY. A lecture course dealing with the application of classical electromagnetic theory to the optical phenomena of reflection, refraction, polarization, and absorption. *Prerequisites: Physics* 111 *and* 108; *and Mathematics* 105*a.* (3) (Staff)

214—TRANSIENT ELECTRIC AND VACUUM TUBE PHENOMENA. A lecture course dealing with transient currents in circuits containing variable amounts of inductance, capacitance, and resistance. Both the methods of differential equations and of the Laplace transform are used. *Prerequisites: Physics* 111 *or* 114; *and Mathematics* 105*a.* (3) (Staff)

215a—QUANTUM THEORY. A lecture course covering a brief review of the origin of quantum theories, mathematical techniques of quantum mechanics, the general aspects of wave mechanics and matrix mechanics, the uncertainty principle. *Prerequisite: Physics* 217*b or equivalent.* (3) (Hahn)

215b—QUANTUM THEORY. A continuation of 215a with extensions into special methods of solving problems in the theory, problems in more than one dimension, and the Pauli and Dirac theories of the electron. *Prerequisite: Physics* 215*a or equivalent.* (3) (Hahn)

217a—THEORETICAL PHYSICS. A course of lectures presenting the basic aspects of theoretical physics in a unified way. Representative topics: advanced dynamics, hydrodynamics, elasticity. *Prerequisites: two "100" courses in physics; and Mathematics* 105*a.* (4) (Lamarsh)

217b—THEORETICAL PHYSICS. A continuation of 217a, dealing with statistical mechanics, thermodynamics, electrodynamics, relativity, quantum theory. *Prerequisite: Physics* 217*a or equivalent.* (4) (Hahn)

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* 123*a, b; and Mathematics* 105*a.* (3) (Kern)

220a-h—SEMINAR. A weekly meeting of the staff and graduate students of the department for presentation and discussion of recent developments in physics and of work in progress in the department. (1 ea.) (Senior Staff)

224—THEORY OF THE SOLID STATE. A lecture and problem course covering the fundamental theory of the structure and properties of complex atoms, molecules, liquids and solids. Topics include mechanical, chemical and thermal properties of matter. *Prerequisites: Physics* 215*a or equivalent.* (3) (Staff)

226a, b—RESEARCH IN PHYSICS. (3 ea.) (Senior Staff)

227a, b—RESEARCH IN PHYSICS. (5 ea.) (Senior Staff)

230a—NUCLEAR PHYSICS. A lecture and problem course dealing with advanced experimental nuclear physics. Topics include properties of nuclei, nuclear transformations, observational methods, radioactivity and interaction of radiation with matter. *Prerequisites: Physics* 217*a or equivalent.* (3) (Hahn)

230b—NUCLEAR PHYSICS. A lecture and problem course concerned with the theories of the structure of atomic nuclei. Topics include nuclear shell structure, internuclear forces, nuclear binding energies, and theory of nuclear reactions. *Prerequisites: Physics* 215*a or equivalent.* (3) (Hahn)

231—ATOMIC STRUCTURE. A lecture and problem course treating the theory of atomic structure. Topics include atomic and molecular spectra, multiplet structure, interatomic and intermolecular forces, and quantum mechanical treatment of the vector model. (3) (Hahn) *Prerequisite: Physics 215a or equivalent.*

232—STATISTICAL MECHANICS. A lecture and problem course dealing with the thermal properties of matter from the standpoint of statistical mechanics. Topics include thermodynamic properties, perfect gases, and Fermi-Dirac statistics. *Prerequisites: Physics 123b and 217a.* (3) (Mockler)

250—COSMIC RAYS AND RELATIVISTIC PHENOMENA. A lecture and problem course dealing with the field of cosmic rays. Topics include relativity theory, interaction of cosmic rays with matter, shower theory, properties and production of mesons. *Prerequisites: Physics 217b or equivalent.* (3) (Kern)

500-1, 2, 3—THESIS. A course 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)

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. Nine 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 pressure groups and a discussion of the organization and functions of political parties in the United States. (3) I (Shannon)

173—PUBLIC OPINION. A study of the nature and function of public opinion together with an analysis of propaganda techniques and the role of the media of communication. (3) II (Shannon)

179—POLITICAL LEADERSHIP. Investigation and discussion of the relations between leaders and led in politics. (3) II, S (Shannon)

Related Courses in Other Departments

Psychology 104—Social Psychology.

II. Public Administration

140—RURAL LOCAL GOVERNMENT. A study of local government in rural America with particular emphasis upon county government. (3) (Vanlandingham)

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 problems of line management and of staff and auxiliary functions, and the problem of administrative responsibility. (3) I, S (Kammerer)

177b—PUBLIC PERSONNEL ADMINISTRATION. A survey of the concept 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. (3) II (Kammerer)

177c—ADMINISTRATIVE REGULATION. The regulatory movement, legal bases of regulation, problems of administration of regulatory agencies, procedure in rulemaking and administrative adjudication, and judicial control. (3) II (Kammerer)

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)

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.
Social Work 130a—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, Christion political thought. (3) I (Shannon)

171b—MODERN POLITICAL THEORY. Study of the writings of Machiavelli, Hobbes, Yocke, Burge, Rousseau, Bentham, Mill and Marx. (3) II (Shannon)

175—CONTEMPORARY AMERICAN POLITICAL THOUGHT. A study of American ideas of laissez faire and free enterprise; the new nationalism, the new freedom, the new deal, and current ideas of America's role in world affairs. (3) II, S (Shannon)

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 elected areas. (3) II, S (Shannon)

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

Related Courses in Other Departments

Philosophy 101a, b—History of Philosophy.

IV. Comparative Government

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

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

168—THE GOVERNMENTS AND POLITICS OF EASTERN ASIA. An introductory study of the political institutions of China, Japan, the Philippines, India, and Indonesia. (3) I, S (Vandenbosch)

V. Public Law

159a—AMERICAN CONSTITUTIONAL DEVELOPMENT. Historical survey of the making of the constitution and its interpretation through principal statutes and judicial decisions down to 1870. (3) I, S (Trimble)

159b—AMERICAN CONSTITUTIONAL DEVELOPMENT. Continuation of the above survey from 1870 to the present. (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)

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 implications of these rights. (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 development of the country and the alteration of our constitutional system. (3) II (Trimble)

Related Courses in Other Departments

History 131a, b—English Constitutional History.
Law 149—Municipal Corporations.
Law 161a, b—Constitutional Law I and II.

VI. International Law and Diplomacy

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

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

160—AMERICAN FOREIGN RELATIONS. An examination of the chief principles and problems of American policies, the control and conduct of American foreign relations. (3) I, S (Vandenbosch)

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

166—THE UNITED NATIONS. Background of the United Nations; functions and development of the chief organs and affiliated agencies; the Great Power Veto; problems achievements. (3) II, S (Vandenbosch)

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)

217—CONTEMPORARY AMERICAN DIPLOMATIC PROBLEMS. An examination of the more important current problems of American foreign policy. (3) I, S (Vandenbosch)

500-1, 2, 3—THESIS. (0) (Staff)

Related Courses in Other Departments

Economics 127—International Economic Policies.
History 100a, b—The Diplomacy and Foreign Policy of the United States.
History 120—Europe in the Twentieth Century.
History 135a, b—The British Empire.

History 145—Russia since 1900.
History 176—France since 1870.
History177—Germany since 1870.
History 190a, b—The Far East.
Law 164—Conflict of Laws.

PSYCHOLOGY

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

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

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

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

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

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

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

A clinic for the correction of speech disorders, such as stuttering and retarded speech development, is operated by the Department of Psychology. The services of this clinic are available to university students, students and teachers in public schools, and to other interested persons.

104—SOCIAL PSYCHOLOGY. Description and explanation of social phenomena in terms of the original and acquired reaction systems of the individual. Topics given special consideration: crowds, mob behavior, propaganda, and nationalism. *Prerequisite: Psychology* 1.
(3) I, II (White)

108—EXPERIMENTAL PSYCHOLOGY. An experimental study of the nature of sensation and perception—the process by which we know the world through our senses: vision; hearing; taste and smell; the skin senses. *Prerequisite: Psychology* 1.
(4) I (Meyers)

113—PSYCHOLOGY OF LEARNING. An experimental study of the learning process with an analysis of various types of learning—verbal learning, form learning, conditioned response learning, acquisition of skills, memory, problem solving, and thinking. *Prerequisite: Psychology* 1.
(4) II (Meyers)

114—ABNORMAL PSYCHOLOGY. 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. *Prerequisite: Psychology* 1.
(3) I, II (Pattie)

115—GENETIC PSYCHOLOGY. Influence of hereditary factors in the development of human behavior. A critical survey of the evidence regarding psychological traits such as musical and other special abilities, intelligence, and interests. *Prerequisite: Psychology* 1.
(3) I (Newbury)

116—ANIMAL BEHAVIOR. Experimental techniques used in investigations of animal behavior. Topics include: heredity and environment, activity, instinct, motivation, learning, sensory discrimination, and personality in subhuman species. *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 the taste preferences. *Prerequisite: Psychology* 1. (2) S (Newbury)

120a-d—INDEPENDENT WORK IN PSYCHOLOGY. Designed for advanced students and graduates who undertake minor research problems to be conducted in regular consultation with the instructor. *Prerequisite: major in the Department with a standing of* 2.0 in *psychology courses.* (2 ea.) I, II, S (Staff)

121—STUDENT PERSONNEL. The methods of dealing with student personnel problems in college and high school, including the problems of selection, classification, grading, personal adjustment, motivation, guidance, and vocational placement. *Prerequisite: Psychology* 1. (3) I (Croft)

124—MENTAL HYGIENE. 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. *Prerequisite: Psychology* 1. (3) I (Bills)

125—EXPERIMENTAL CHILD STUDY. An advanced course in the psychology of the normal child. The scientific background of experimental and observation method. Opportunities are provided to work with children. *Prerequisite: Psychology* 7. (3) II (Estes)

127—INTRODUCTION TO INDUSTRIAL PSYCHOLOGY. Review of the functions and findings of psychology applicable to business and industry. Topics covered are: employment procedures, personnel testing, attitude analysis, motivation, and morale. *Prerequisite: Psychology* 1. (3) II (Mellenbruch)

128—PSYCHOLOGY OF INDUSTRIAL PERSONNEL PROCEDURES. A practical course for those preparing for personnel administration and for psychology in industry and business. A study is made of the theory and methods of position classification, job analysis, job evaluation, merit rating, supervisor selection and training, and collective bargaining. *Prerequisite: Psychology* 1. (3) II (Mellenbruch)

130a—SPEECH CORRECTION: A SURVEY. An introduction to the nature, causes and treatment of the major disorders of speech: articulation, stuttering, voice, cleft palate, hearing, cerebral palsy and aphasia. *Prerequisite: 9 semester credits in Psychology.* (3) I (Diehl)

130b—SPEECH CORRECTION: AN INTRODUCTION TO THERAPY. Observation and discussion of and limited supervised experience with therapeutic techniques and procedures of speech therapy. *Prerequisite: May be taken concurrently with* 130*a*. (3) I, II (Diehl)

131—STUTTERING AND ITS CORRECTION. The nature, causes and treatment of stuttering, with emphasis on therapeutic methods. *Prerequisite: Psychology* 130*a*. (3) II (Diehl)

141—PSYCHOLOGY OF THE CRIMINAL. A study of psychological factors involved in criminality, with special emphasis on the emotional and personality patterns underlying the life of the criminal, and the problems brought about by incarceration. *Prerequisite: Psychology* 1. (2) I, II (Watson)

150—PSYCHOLOGICAL TESTING. A general orientation to the field of psychological testing. Introduction to the principles and methods of psychological testing, and a survey of the various kinds of psychological tests. *Prerequisite: Psychology* 1, 8. (3) I, II (Estes)

201a—SEMINAR IN PSYCHOLOGY. One two-hour discussion each week on a research problem under investigation by a graduate student or staff member. (1) I, II (Staff)

201b-h—SEMINAR IN PSYCHOLOGY. Continuation of 201a. These numbers are provided for registration in succeeding semesters. (1) I, II (Staff)

203a—PROBLEMS IN PSYCHOLOGY. Shorter research problems are registered under this number. A minimum of six hours per week is required in consultation with the instructor. (2) I, II, S (Staff)

203b-h—PROBLEMS IN PSYCHOLOGY. Continuation of research. These numbers are provided for registration in subsequent semesters. (2) I, II, S (Staff)

205a, b—SEMINAR IN SOCIAL PSYCHOLOGY. Each semester some topic in the field of social psychology such as attitudes and beliefs, structure and function of social groups, social determinants of behavior, leadership, and morale will be studied intensively. (3) I, II (White)

210a—RESEARCH IN PSYCHOLOGY. Research or thesis work may be registered under this number. A minimum of nine hours a week is required on research conducted in consultation with the instructor. (3) I, II, S (Staff)

210b-h—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. *Prerequisite: an advanced course in experimental psychology and elementary statistics, or equivalent.* (3) I (Calvin)

212—THE EMOTIONS. An experimental study of feeling and emotion. The following aspects of emotional behavior are considered: the conscious experience of emotion; behavior in emotional situations; physiological changes accompanying emotion. *Prerequisite: Psychology* 108 *or equivalent.* (3) II (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. *Prerequisite: Psychology* 113 *or equivalent.* (3) II (Calvin)

215—PSYCHOMETRICS. Analysis 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* 4 *or equivalent.* (3) I, II (North)

217—PSYCHOLOGY OF LANGUAGE. A survey of semantic uses of languages as related to human behavior. Special attention will be given to language problems of brain injured: aphasic, cerebral palsied, and mentally disordered. (2) II (Diehl)

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 (Blanton)

222—SYSTEMS OF PSYCHOLOGY AND THEIR HISTORY. A survey of the history of psychology and an intensive study of current systems of psychology. (3) I (Pattie)

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

226—PSYCHOLOGICAL MEASURING INSTRUMENTS. A study is made of a wide variety of psychological tests including group intelligence tests, personality and interest inventories, area aptitude tests, and special aptitude tests. (3) II (Mellenbruch)

230—PERSONALITY THEORY. An intensive survey of the major psychiatric, psychological, and sociological theories of personality structure and development. The relation of these theories to psychological research on personality will be examined. (3) I

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. *Prerequisite: Psychology* 215. (3) I (Mellenbruch)

234b—TEST STANDARDIZATION. A continuation of 234a. The student will administer a revised form of his preliminary test to an adequate sampling of the appropriate population and will determine its reliability and validity. *Prerequisite: Psychology* 234*a.* (3) II (Mellenbruch)

235—DIAGNOSIS AND COUNSELING IN A STUDENT PERSONNEL PROGRAM. An advanced course in techniques for collecting information for student counseling, diagnostic techniques, and the techniques of counseling and interviewing. *Prerequisites: A graduate major in psychology or education and Psychology* 121. (3) II (Croft)

237—CLINICAL TESTING. Practical experience in the application of clinical diagnostic techniques to a variety of pathological subjects. *Prerequisite: Psychology* 150. (2) I, II (Watson)

238—THE RORSCHACH TEST. An introduction to the Rorschach test as a clinical instrument. Practice in administering, scoring and interpreting the test. *Prerequisite: Psychology* 219. (4) I (Dimmick)

239—THE THEMATIC APPERCEPTION TEST. An introduction to the Thematic Apperception Test as an instrument for obtaining information concerning thought content, attitudes, and feelings. Practice in administering, scoring, interpretation. *Prerequisite: Psychology* 238. (3) II

240a—THERAPEUTIC PROCEDURES. Theory and technique of non-directive psychotherapy. Consideration will be given to the personality theory formulated for the technique and the supporting evidence. Supervised counseling experience. *Prerequisites Psychology* 219. (3) I (Bills)

240b—THERAPEUTIC PROCEDURES. History, evolution and rationale of various psychotherapeutic procedures including directive psychotherapy, play therapy, use of painting and drawing. Demonstrations and supervised experience in these techniques. *Prerequisite: Psychology* 219. (3) II (Dimmick)

241—MOTIVATION. A survey of our present knowledge—clinical, experimental, and observational—of affective and conative factors in psychopathology. Psychoanalytic theory of motivation of behavior is emphasized. (3) II (Dimmick)

245—ADVANCED ABNORMAL PSYCHOLOGY. Special consideration is given the neuroses and the psychoses. Emphasis is placed upon the problems of differential diagnosis through the use of psychological techniques. *Prerequisites: a master's degree in psychology or equivalent training; and permission of instructor.* (3) II (Dimmick)

250—THE RORSCHACH TEST. Advanced course. In this course emphasis will be placed on the interpretation of a wide range of normal and pathological Rorschach records. *Prerequisite: Psychology* 238. (4) II (Dimmick)

270—PSYCHOLOGICAL EXPERIMENTATION. A study of the application of experimental methods in the major areas of psychology, including sensation and perception, learning, motivation, emotion, and personality. The design of research studies will be emphasized. *Prerequisites: Psychology* 108 *and* 113. (3) I, II (Calvin)

300a—MEDICAL THERAPEUTIC PROCEDURE. Rationale, procedures, and results of four important psychiatric therapeutic methods: (1) electrical and pharmacological shock, (2) narcohypnosis or drug-analytic methods, (3) malaria and other types of fever therapy, and (4) prefrontal lobotomy. (1) I (Straus)

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

310a—PRACTICUM IN CLINICAL PSYCHOLOGY. Students rotate among five different institutions, including enuropsychiatric hospitals, reformatories, institutes for the feeble-minded, and child guidance clinics. *Prerequisite: Psychology* 226, 238. (3) I, II (Staff)

310b-h—PRACTICUM IN CLINICAL PSYCHOLOGY. Continuation of 310a. These numbers are provided for registration in succeeding semesters. (3) I, II (Staff)

311a—PRACTICUM IN STUDENT PERSONNEL. Nine hours of supervised work each week in the University Personnel Office. (3) I, II (Croft)

311b-h—PRACTICUM IN STUDENT PERSONNEL. Continuation of 311a. These numbers are provided for registration in succeeding semesters. (3) I, II (Croft)

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

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

315a, b—PRACTICUM IN SPEECH THERAPY. Practical case work in speech therapy in speech clinic, hospitals, and public schools. Training in diagnostic examinations, case history methods, and group therapy. *Prerequisite: Psychology* 130*a, b.* (3) II (Diehl)

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. (1) I, II, S (Dimmick)

500-1, 2, 3—THESIS. (0)

RADIO ARTS

While no advanced degrees are offered at present with a major in Radio Arts, graduate students may find the following courses of value if they are interested in any phase of radio, television, or film work.

Departmental facilities include an FM transmitter, three studios, two announce booths, three studio control rooms, library, record room, sound effects room. Also daily broadcasts are scheduled over nearby commercial stations, as well as state-wide "network" shows.

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) (Press)

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, or permission of instructor.* (2) (Halyard)

103—RADIO AND TELEVISION ADVERTISING. Two recitation periods per week. The data and techniques of radio and television advertising including problems of coverage and circulation, spot campaigns, testing, time buying, the agency, measuring broadcast effectiveness, merchandising radio and television advertising, and time selling. (2) (Hallock)

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

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) (Hallock)

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*a,* 1 *and* 106*a, or permission of instructor.* (2) (Hallock)

110—PROSEMINAR. One recitation per week. Lectures and outside readings devoted to radio and its relation to other communications media from the standpoint of structure, function, process, basic tools of research, control, content, radio as a channel, the audience and effect. *Prerequisite: permission of instructor.* (1) (Press)

111–CINEMATOGRAPHY. One recitation and two hours laboratory per week. The art of making films for television, including the mechanics of motion picture photography. A study of equipment, lenses, lighting, color, editing and set designing. *Prerequisite: consent of instructor.* (2) (Hallock)

SOCIOLOGY

Advanced degrees available with major work in sociology are Master of Arts, Master of Science, Master of Science in Agriculture, and Doctor of Philosophy.

The University of Kentucky has two departments concerned with sociology: The Department of Sociology in the College of Arts and Sciences and the Department of Rural Sociology in the College of Agriculture and Home Economics. The departments have common headship, a common chairman of graduate study, and a coordinated program of graduate instruction. Each graduate student is assigned an adviser according to his field of interest.

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

In the Department of Sociology there are:

1. The Social Research Consultation Service, offering professional assistance in studies and surveys.
2. The Bureau of Community Service, offering counsel to citizens interested in community improvement.

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

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

102–SOCIAL PATHOLOGY. A systematic examination of the various types of social disorganization, with particular emphasis upon the sociological explanation of underlying factors. *Prerequisite: one sociology course.* (3) II (Hughes)

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 measures for the prevention of crime. (3) I, II, S (Hughes)

104–SOCIAL PSYCHOLOGY. (Same as Psychology 104) Description and explanation of social phenomena in terms of the original and acquired reaction systems of the individual. Topics given special attention: crowds, mob behavior, propaganda, and nationalism. *Prerequisite: Psychology 1a, b.* (3) I, II, S (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. *Prerequisite: one sociology course.* (3) I (Hughes)

106–PRINCIPLES OF SOCIOLOGY. A survey of the basic elements of culture, collective behavior, communities, social institutions, and social change. Basic concepts required for the analysis of sociological data are systematically considered. (3) I, II, S (Sutton)

107–COMPARATIVE SOCIOLOGY. A study of the dynamics of culture as shown in a primitive, a peasant, and a modern culture system. (3) I (Sanders)

109a–THE FAMILY. A study of the institutions of marriage and the family and an analysis of the various factors and forces at work in our time which are affecting the individual marital relationship. *Prerequisite: two sociology courses.* (3) I, II, S (Gladden)

109b–THE FAMILY. A study of the various social situations in which children grow to early adolescence with emphasis on the primary group relationships in home, neighborhood, play group, and school. *Prerequisite: Sociology 109a or permission of instructor.* (3) I, II, S (Gladden)

114a-d–INDEPENDENT WORK. Study of some special topic by duly authorized students. For sociology majors only. (1 ea.) I, II, S (Staff)

121—POPULATION PROBLEMS. A study of movements and trends in population, with respect to race, age, birth-rates, etc. *Prerequisite: Sociology 124 or its equivalent.* (3) I (Beers)

122—CONTEMPORARY SOCIOLOGICAL THEORY. A study of the leading developments in sociological theory and methodology from Comte to the present time. *Prerequisite: two sociology courses.* (3) II (Anderson)

124—TECHNIQUES OF SOCIAL INVESTIGATION. A study of the practical applications of sociology in organizing, conducting, and interpreting social surveys and other forms of sociological research. *Prerequisite: one sociology course.* (3) I (Coleman)

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. *Prerequisites: one sociology and one economics course.* (3) I (Gladden)

127—SOCIAL CLASSES. A systematic treatment of the factors underlying differentiation and stratification, with particular attention to caste and class; social mobility in American society. *Prerequisite: one sociology course.* (3) I (Anderson)

128—THE SOCIOLOGY OF THE SOUTH. Analysis of the population and social organization of the south and of the factors influencing the development and utilization of the human resources of the region. *Prerequisite: senior standing of social science majors; others by arrangement.* (3) II, S (Anderson)

129—RELIGION AND CULTURE. An analysis of the structure, function, and process of religion, using the development of the Hebrew and Christian religions to show social origins of the two faiths and the effect of cultural change on their growth. (3) I (Gladden)

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

132a, b—INTERGROUP RELATIONS. Analysis of relationships between groups which differ in religious, ethnic, or socio-cultural backgrounds; the development of educational and social techniques for reduction of tensions. (Same as Education 132a, b) (3 ea.) S

142—CULTURE AND PERSONALITY. The cultural basis of personality. Personal character considered as the result of culturally fostered patterns. The ideal personality in several selected societies. Lectures 3 hours (Same as Anthropology 142). (3) (Essene)

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

170—THE CITY. This course is a study of the sociology of city life. The major emphasis is upon the ecological and social characteristics of urban life in contrast to rural community life. *Prerequisite: an introductory sociology course or with approval of instructor.* (3) II (Sutton)

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

202a-j—SPECIAL PROBLEMS IN SOCIOLOGY. The purpose of this course is to provide an opportunity for advanced graduate students with special interests to pursue specialized reading under supervision. (1) I, II, S (Staff)

205a, b—SEMINAR IN SOCIAL PSYCHOLOGY. (Same as Psychology 205a-b) Each semester some topic in the field of social psychology, such as attitudes and beliefs, structure and function of social groups, social determinants of behavior, leadership, and morale will be studied intensively. (3 ea.) II

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) II (Gladden)

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

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

228—SOCIOLOGY OF RELIGION. Critical study of reciprocal relation of religion and culture, the function of religion in society, social sources of religious concepts, religious differentiation and institutionalization, the problem of church and state. (3) II (Gladden)

230—EDUCATIONAL SOCIOLOGY. (Same as Education 230.) A course in the sociological foundations of education. (3) II, S (Hartford)

260—PROBLEMS IN EDUCATIONAL SOCIOLOGY. An advanced course in the application of sociological findings to education, including consideration of southern regional problems and potentialities. *Prerequisite: 12 semester hours of graduate work including Education 230 or equivalent.* (Same as Education 260.) (3) S

500-1, 2, 3—THESIS. (0) I, II, S (Staff)

RURAL SOCIOLOGY *(See Agriculture)*

SOCIAL WORK

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

100–PUBLIC WELFARE ADMINISTRATION. Philosophy, background, and methods of tax-supported social work. The inter-relationship of federal, state and local services; standards and supervision as influenced by federal security legislation. *Prerequisite: two courses in social work.* (3) II (Wetzel)

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 interpretations and their implication for social case work. For majors in the department. *Prerequisite: two courses in social work or special permission.* (2) I (Gail)

111a-d–INDEPENDENT WORK. Conferences, assigned readings, reports on minor research problems. Open to majors in the department by special permission. (1 ea.) I, II, S (Staff)

113–INTRODUCTION TO SOCIAL CASE WORK. 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 or special permission.* (2) II (Theobald)

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. Function, method, and philosophy of contemporary social work. The divisions of the field (case work, group work, community organization) and the professional status of social work will be considered. (3) I, II, S (Popeo)

130a–COMMUNITY ORGANIZATION FOR SOCIAL WELFARE. Methods and techniques of social welfare planning. Analysis of needs and resources, coordination of agencies, financing and developing chest and council programs, and the interpretation of social work. (3) I, S (Wetzel)

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: S.W. 130a or permission of instructor.* (3) II (Wetzel)

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 (Popeo)

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: S.W. 140a or permission of instructor.* (3) II (Popeo)

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 to be taken concurrently): S.W. 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: S.W. 113, or special permission.* (2) II (Theobald)

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)

ZOOLOGY

101a–HISTOLOGY. Histology of the tissues. A course in the technique of preparation of animal tissues for microscopic study. Practice in imbedding, staining, sectioning, mounting, and identification of tissues. *Prerequisite: Zoology 1.* (4) I, II, S (Brauer)

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)

102—ORNITHOLOGY. A study of the life-histories, habits, identification, structure, adaptations, and physiology of birds. Special emphasis upon migrations, songs, nests and economic importance of our native birds. Lectures; field excursions; laboratory studies. *Prerequisite: Zoology* 1. (4) II, S (Barbour)

103a—GENERAL ENTOMOLOGY. A beginning course in the study of this greatest group of the Animal Kingdom. Anatomy, morphology, adaptations, life-histories of representatives of the most important orders of insects and other arthropod classes. *Prerequisite: Zoology* 1. (3) I (Allen)

103b—GENERAL ENTOMOLOGY. Continuation of 103a. More detailed study of the orders and many representative families. Methods of making and preserving insect collections. Identification; life-history, ecology of many insect species. Making an individual collection. *Prerequisite: Zoology* 103*a*. (3) II (Allen)

105—PARASITOLOGY. Protozoan, helminth and arthropod parasites of man and domestic animals, emphasis on etiology, epidemiology, methods of diagnosis, control measures and life histories. Techniques for host examination and preparation of material for study. *Prerequisite: Zoology* 1. (4) 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 pig. *Prerequisite: Zoology* 1. (4) II, S (Brauer)

108a—PRINCIPLES OF ZOOLOGY (Evolution). An advanced lecture course on some of the fundamental principles of animal biology. Organic evolution and related dynamic aspects of the living organism. Three times a week. (2) I, S (Allen)

108b—PRINCIPLES OF ZOOLOGY (Heredity). Lectures and recitations on principles of heredity, variation and eugenics. Two hours per week. (2) II, S

109—ANIMAL ECOLOGY. An analysis of the environment and the respective adjustments of animal life to the environmental complex. Habitats, food, respiratory needs and mechanisms, life-histories, animal associations, adaptations. *Prerequisite: Zoology* 1. (3) I (Allen)

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

111—SPECIAL MICROTECHNIQUE. Special methods in histological techniques for students in Zoology, Pathology and Anatomy. *Prerequisites: Zoology* 101*a, b*. (3) I, II (Brauer)

112—ICHTHYOLOGY. Taxonomy of fishes with life-histories and biology of types. Fish structure and physiology, habits, ecology. Fish-culture and economic Ichthyology; care of fishes, aquaria, etc. Elements of fresh-water fishery administration. *Prerequisite: Zoology* 1. (4) I (Allen)

114a-f—ZOOLOGICAL SEMINAR. Reports on: technical papers in scientific journals, book review, recent developments in Zoology, scientific meetings. Tutorial instruction preparatory to comprehensive examination. Required of all majors in Zoology. (1 ea.) I, II (Staff)

117—MEDICAL PROTOZOOLOGY. The etiology, epidemiology, pathology, diagnosis, prophylaxis and control of parasitic protozoa, with special emphasis on life cycles and detailed studies of the protozoan parasites of man. Given alternate years. *Prerequisite: Zoology* 105. (4) II, S (Edney)

119—HELMINTHOLOGY. The etiology, epidemiology, pathology, diagnosis, prophylaxis and control of trematode, cestode and namatode parasites of vertebrates, with special emphasis on those of veterinary and medical importance. Given alternate years. *Prerequisite: Zoology* 105. (4) II, S (Edney)

123—MEDICAL ENTOMOLOGY. Study of Arthropod vectors of disease. Structure, collection, identification, control measures and life history studies. Given alternate years. *Prerequisite: Zoology* 105. (4) I, S (Edney)

126—SPECIATION. Mechanisms of Evolution. A discussion of modern theories and problems concerning the formation of animals and plant species. Three hours per week. *Prerequisite: Eight hours of Biological Sciences including Zoology* 1. (3) I, II (Carpenter)

140—HERPETOLOGY. Designed to acquaint the student with the amphibians and reptiles of eastern North America, their taxonomy, adaptations and natural history. Given alternate years. *Prerequisite: Zoology* 1. (4) II (Barbour)

141—MAMMALOGY. Designed to acquaint the student with the mammals of eastern North America, their taxonomy, adaptations and natural history. Given alternate years. *Prerequisite: Zoology* 1. (4) I (Barbour)

157a—INVERTEBRATE ANATOMY. An advanced course on the comparative anatomy of invertebrate animals with special attention paid to phylogeny, organology, and taxonomy. *Prerequisite: Zoology* 1. (4) I (Brauer)

157b—COMPARATIVE VERTEBRATE ANATOMY. Systematic consideration of chordates with emphasis on vertebrates. Comparative studies of chordate morphology, phylogeny, ontogeny, organology, physiology and homology. Laboratory studies on typical prochordates, cyclostomes, gnothostmes and the cat. *Prerequisite: Zoology* 1. (4) I (Edney)

166–PHYSIOLOGY OF DEVELOPMENT. A review of theories of differentiation and a consideration of the genetic environment, and correlative physiological factors in differentiation. Lectures, assigned readings and literature reports. *Prerequisites: Zoology* 1, 7*a*, *b*, *or* 106. (3) I (Brauer)

COURSES PRIMARILY FOR GRADUATE STUDENTS

Qualified students may elect work in any special field listed below. Independent work under direction, with conferences on objectives, principles, materials, methods, analysis of data and conclusions. Progress reports required at intervals.

202a-d–PROBLEMS IN ORNITHOLOGY. (3) I, II, S (Barbour)
205a-d–PROBLEMS IN PARASITOLOGY. (3) I, II, S (Edney)
206a-d–PROBLEMS IN EMBRYOLOGY AND HISTOLOGY. (3) I, II, S (Brauer)
209a-d–PROBLEMS IN ECOLOGY. (3) I, II, S (Allen)
212a-d–PROBLEMS IN ICHTHYOLOGY. (3) I, II, S (Allen)
216a-d–PROBLEMS IN SPECIATION. (3) I, II, S (Carpenter)
221a-d–PROBLEMS IN HERPETOLOGY & MAMMALOGY. (3) I, II, S (Barbour)

500-1, 2, 3–THESIS. *Prerequisites: the bachelor's degree in Zoology, permission of instructor and evidence of capacity for research.* (0) (Staff)

III. COMMERCE AND ECONOMICS

REQUIREMENTS FOR ADVANCED DEGREES IN COMMERCE AND ECONOMICS

The Degree of Master of Business Administration

1. Admission to study for the degree is open to students who hold:
   a. A Bachelor of Science in Commerce degree from the University of Kentucky, or
   b. A Bachelor's degree from an accredited college or university.

2. Graduate study in business presumes a minimum preparation in economics and business, including the completion of the following courses or their equivalent:

Principles of Economics	3 hrs.
Principles of Accounting	6 hrs.
Principles of Marketing	3 hrs.
Labor Economics	3 hrs.
Money and Banking	3 hrs.
Statistical Method	3 hrs.
Corporation Finance	3 hrs.
Business Law	6 hrs.
Industrial Management	3 hrs.

3. Admission to study for the degree requires the completion of 27 semester hours of the foregoing courses. The remaining courses, if numbered above 100, may be taken during graduate study and presented as electives toward the 30 semester-hour course requirement. The candidate is not eligible for the M.B.A. degree until he has completed all of the foregoing courses in either undergraduate or graduate study.

4. A minimum of 18 semester hours must be presented in courses numbered 200 or above. The remaining 12 required hours may be taken in any approved courses numbered 100 or above. With the permission of the student's Director of Graduate Studies, the candidate may submit a maximum of 9 hours in related courses outside the College of Commerce.

5. The course requirements are as follows:

200—Business Economics	3 hrs.
237—Advanced Business Management	3 hrs.
256—Research and Report Writing	3 hrs.
An advanced course in Accounting	2 or 3 hrs.
Two of the following courses:	
217—Corporate Financial Policy (Econ. 211, Adv. Money & Banking, may be offered to meet the finance course requirement.)	
255—Adv. Personnel Management	
260—Adv. Marketing Management	
Electives	13 or 12 hrs.
Total	30 hrs.

In special cases the student's Director of Graduate Studies may approve the substitution of another graduate course for a required course.

6. Further requirements, in addition to the completion of prescribed courses, are as follows:
   a. Residence for at least two semesters at the University of Kentucky as a full-time student, or its equivalent as a part-time student.
   b. The maintenance of a minimum average of grade B in all courses taken as a graduate student. A minimum grade of C is required for credit in a course.
   c. If essential to the program pursued by the student, a reading knowledge of a modern foreign language may be required by the student's Director of Graduate Studies.
   d. A comprehensive final examination.

The Degree of Master of Science

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 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.

The Doctor's Degree with a Major in Economics

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

The scope of the qualifying examination will include a comprehensive written test of the student's ability to deal with economics materials and will cover the following classes of subject matter: (1) elementary accounting, statistics, and economic history; (2) advanced economic theory; (3) four other fields in economics or in business; (4) a minor subject closely related to economics, such as business administration, political science, agricultural economics or sociology.

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

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

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

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

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

Statistics: Economics 107 and 210; Commerce 149, 171 and 172; Math 120; and Psy. 215.

Private Finance: Economics 105, 154, 209, 211; Commerce 117, 129, 131, 160, 217.

Public Finance: Economics 104, 124, 206a, b, 207a, b, 285; Commerce 15[illegible] and 159; Law 153, 161; and Political Science 177a, b.

Industrial relations: Economics 102, 130, 155, 166, 255; Law 180; Psychology 127; and Political Science 177b.

Utilities and transportation: Economics 103 and 126; and Law 150, 161.

Accounting: Commerce 108, 113, 118, 129, 132a, b, 133, 146, 159, and 23[illegible]

Industrial management: Commerce 118, 137, 138, 139, 145 and 237; Economics 155; and Psychology 127.

Marketing: Commerce 119, 136, 140, 141, 149 and 260; Economics 1[illegible] and Ag. Econ. 101.

Risk and risk bearing: Commerce 143 and 144; Economics 200; 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 no less than fifteen semester hours must represent courses and seminars numbered 200 and above.

DESCRIPTION OF COURSES

COMMERCE

101a-c—SECRETARIAL JOB TRAINING. This course is designed to provide laboratory and office experience for senior secretarial students. *Prerequisite: Commerce 14b.* (1 ea.) I, II (Thomas)

108—ACCOUNTING THEORY. The function of accounting, asset valuation, recognition of revenue and expenses, and classification of equities will be studied with a view to presenting a coordinated body of accounting theory. *Prerequisite: Commerce 96b.* (2) I (Haun)

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

113—AUDITING. The theory of auditing, the valuation of assets, analysis of accounting procedure, and the presentation of statements. Special problems applicable to particular business will also be presented. *Prerequisite: Commerce 96b.* (3) II (Beals)

117—CORPORATION FINANCE. Principles concerning the issue of securities, the management of the corporate income, the disbursement of dividends, the creation of sinking funds, and reorganization procedure. *Prerequisites: Commerce 7b and Economics 52.* (3) I, II (Pickett)

118—COST ACCOUNTING. The place of cost accounting in the general field of accounting, special records and cost statistics, and application to particular businesses. *Prerequisite: Commerce 7b.* (3) I (Beals)

119—RETAIL MERCHANDISING. Selecting a business location, internal layout, departmentalization, merchandising control, store policies toward the public, training and management of personnel, and related subjects. *Prerequisite: Commerce 60.* (3) II (McIntyre)

128—ADVANCED COST ACCOUNTING. The use of standard costs, estimated cost systems and procedures, non-manufacturing costs, budgetary control, and management uses of cost data. *Prerequisite: Commerce 118.* (3) II (Beals)

129—CREDIT AND STATEMENT ANALYSIS. The theory underlying credit-granting; credit administration; analysis and interpretation of financial statements. *Prerequisite: Commerce 7a.* (2) I (Haun and Beals)

131—INVESTMENTS. Analysis of corporation statements for investment purposes; the security market; market influences on security prices; effect of interest changes on security prices; and the development of investment programs. *Prerequisites: Economics 105 and Commerce 117.* (3) II (Pickett)

132a, b—C. P. A. PROBLEMS. This course is designed to prepare students for C. P. A. examinations. Advanced accounting theory is stressed through the study of a wide range of problems. *Prerequisite: Commerce 96b.* (3 ea.) I, II (Haun and Beals)

133—INCOME TAX PROCEDURE. The preparation of income tax returns for individuals and corporations of all classes and a practical application of principles of accounting. *Prerequisite: Commerce 96b.* (3) II (Haun)

136—SALES MANAGEMENT. The case method is used, supplemented with outside reading and written reports. *Prerequisite: Commerce 60.* (3) I (McIntyre)

137—INDUSTRIAL MANAGEMENT. Management of manufacturing operations including organization theory, physical aspects of the plant, quality control, time and motion study, production control, industrial safety and industrial relations. (3) I, II (Carter and Haynes)

138—CASES IN MANAGEMENT. Emphasizes production, plant layout wage payments, personnel management, production control, and related problems. *Prerequisite: Commerce 137.* (3) II (Haynes)

139—INDUSTRIAL PURCHASING. Organization of purchasing; relations with other departments; qualifications and training of buyers. Purchasing procedures; sources of supply; price negotiation; stores control; value analysis. *Prerequisite: Economics 52.* (3) II (Coolsen)

140—PROBLEMS IN ADVERTISING. A study of specific problems confronted by the marketing executive in the use of advertising as a selling tool, and of the general economic effects of advertising. *Prerequisite: Commerce 62.* (2) I (McIntyre)

141—INDUSTRIAL MARKETING. The marketing of goods for business consumption. The structure of the industrial market with special problems in marketing raw materials, parts and machinery relative to manufacturing, agricultural, mining, construction and other industries. *Prerequisite: Economics 52.* (3) I (Coolsen)

143—LIFE INSURANCE. Economics of life insurance; organization and control; special forms of life insurance; fundamental principles of rate-making. *Prerequisite: Economics 52.* (3) I (Hargreaves)

144—PROPERTY AND CASUALTY INSURANCE. Public control; nature of contracts; analysis of reserve functions and rate-making processes. *Prerequisite: Economics 52.* (3) II (Pickett)

145—OFFICE MANAGEMENT. Planning and scheduling of work; employment procedures; supervision of employees, re-training, promotion; equipment. (3) II (Speck)

146–SPECIALIZED ACCOUNTING PROBLEMS. Accounting records for consolid tions and mergers, preparation of consolidated statements. Insolvency and receivership re ords and statements. Accounting for estates and trusts. *Prerequisite: Commerce 96b.* (3) II (Grady)

149–MARKET RESEARCH. Training in the application of scientific method to m search in fields of marketing. A major marketing investigation will be conducted by th class. *Prerequisites: Commerce 60 and a course in statistics.* (3) I (Coolsen)

156–BUSINESS REPORTS. Major emphasis is placed upon sources of data, compil tion and arrangement of data, documentation, bibliographies and effective presentation of r ports. Problems are assigned in the various areas of interest. (2) I, II (Speck)

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

162–SMALL BUSINESS OPERATION. Application of management principles an techniques to the special problems of establishing and operating a small business enterpri (2) II (Massie)

170–CONTROLLERSHIP. The organizational position of the Comptroller, his functio and objectives; his methods and procedures. *Prerequisites: Commerce 96a and 118.* (3) I (Haun)

171–STATISTICAL QUALITY CONTROL. Elementary probability theory, contr charts, acceptance sampling plans including single, double and sequential sampling. (2) I (Christian)

172–SAMPLING TECHNIQUES. Application of sampling theory and significan testing in economic research, practical problems in sample design. (2) II (Christian)

175–PUBLIC UTILITY ACCOUNTING. Accounting problems peculiar to publ utilities, especially as to (1) large investment in plant, (2) volume of transaction wi customers and (3) accounting requirements of regulatory bodies. (2) I (Beals)

177a–COLLEGE BUSINESS MANAGEMENT. Elements of management organizati budgetary procedure, financial accounting, procurement techniques and property manag ment as applied in the business administration of colleges. (2) I (Peterson)

177b–COLLEGE BUSINESS MANAGEMENT. Elements of personnel manageme public relations, investments and finance as related to college business management. (2) II (Peterson)

217–CORPORATE FINANCIAL POLICY. A study of financial management from t viewpoint of the corporate financial officer. Problems of planning the capital structu issuing securities, the management of working capital and policies with reference to reserv surplus and dividends. (3) I (Pickett)

222–TAX ACCOUNTING PROBLEMS. Advanced tax accounting problems of complex nature involved in income taxes, gift taxes, and death taxes under the federal a state laws. *Prerequisite: Commerce 133.* (3) II (Haun)

231–INVESTMENT MANAGEMENT. Evaluation of courses of information and a vice concerning securities, methods of analysis and policies of individuals and institutio in the management of investment funds. *Prerequisite: appropriate undergraduate courses accounting and finance.* (3) II (Pickett)

237–ADVANCED BUSINESS MANAGEMENT. A functional study of business ma agement. Control devices and procedures for carrying out and testing policies. (3) II (Haynes)

260–ADVANCED MARKETING MANAGEMENT. A critical study of signifi trends, controversial issues and advanced techniques in the fields of marketing. (3) II (Coolsen)

ECONOMICS

102–LABOR ECONOMICS. Insecurity, wages and income, substandard workers, dustrial conflict; wage theories, the economics of collective bargaining, unionism in its st tural and functional aspects; recent developments. *Prerequisite: Economics 52.* (3) I (Carter)

103–TRANSPORTATION. Railway, waterways, highways, airways. Rates, servi management, regulation. *Prerequisite: Economics 52.* (3) I (Tolman)

104–PUBLIC FINANCE. A study of public receipts; public expenditures; the pr ciples of taxation with special reference to their application to the tax systems, federal a state. *Prerequisite: Economics 52.* (3) I (Martin and Sullivan)

105–MONEY AND BANKING. Nature and functions of money; the importance credit; relation of money and credit to prices; bank deposits and loans; complete study our national banking system. *Prerequisite: Economics 52.* (3) I, II (Master

107–STATISTICAL METHOD. Introduction to the sources of business data, the of calculating machinery, tabulation, simple charts and graphs, the averages, dispersi correlation, and time series analysis. (3) I (Christian)

110–BUSINESS CYCLES. The nature and characteristics of the economic fac which underlie the cyclical fluctuations in business conditions; the methods of business investment forecasting. *Prerequisite: Economics 52.* (3) I, II (Haynes)

112a-f–INDIVIDUAL WORK IN ECONOMICS. Students confer individually with the instructor. (1 ea.) I, II (Staff)

115–VALUE AND DISTRIBUTION THEORY. The major emphasis is on current theory. (3) I (Sullivan)

124–STATE AND LOCAL TAXATION. Classified property taxes; separation of sources of revenue, taxation of banks, forests, public utilities, mines, and rural and urban real estate; income, inheritance and sales taxes. (3) II (Martin)

125–EVOLUTION OF ECONOMIC INSTITUTIONS. The rise of economic institutions such as property rights, capital formation, contractual labor, *et cetera. Prerequisite: Economics* 2 *or permission of instructor.* (3) II (Jennings)

126–ECONOMICS OF PUBLIC UTILITIES. Growth and development of public utilities; valuation; rate-making; financing; the holding company; regulation; current problems; accounting. *Prerequisite: Economics* 52. (3) I (Haynes)

127–INTERNATIONAL ECONOMICS. Free trade; protectionism; preferential tariffs; colonial tariff policies; dumping; commercial treaties; control of raw materials, and the movement of capital; international debts; reparations. *Prerequisite: Economics* 52. (3) II (Sullivan)

130–LABOR LEGISLATION. The status of labor law, mediation, conciliation, arbitration, the minimum wage, the eight-hour day, unemployment relief, safety and health legislation, and social insurance. *Prerequisite: Economics* 52. (3) II (Carter)

134–ADVANCED ECONOMIC HISTORY OF THE UNITED STATES. Population growth, immigration, territorial expansion, agriculture, manufactures, tariff, labor, industrial combinations, commerce, transportation facilities, money and banking, and conservation. (3) II (Jennings)

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

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

153–THE ECONOMICS OF CONSUMPTION. The place of consumption in economic theory; the institutional background of our consumer habits; sources of information on consumption; and government regulation of consumer standards. (2) II (Sullivan)

154–URBAN REAL ESTATE. Urban land economics; the real estate business; essentials of real estate law and contracts, the financing of real estate transactions, property valuation and appraisal, the management of real estate properties. *Prerequisite: Economics* 52. (3) II (Pickett)

155–INDUSTRIAL RELATIONS. Historical development of industrial relations; the economic implications of job analysis, recruitment, selection and training for industry; wages, hours, promotion and health policies; employee representation, collective bargaining; union-management cooperation. *Prerequisite: Economics* 52. (3) II (Carter)

160–BUSINESS COMBINATIONS. Forms of combination; the problem of monopoly; federal and state anti-trust legislation and court decision. *Prerequisite: Economics* 52. (2) II (Massie)

165–COMPARATIVE ECONOMIC SYSTEMS. A study of capitalism, socialism, fascism, communism and cooperation, with attention to current experiments in economic planning. *Prerequisite: Economics* 52. (3) I (Masten)

166–PERSONNEL PROBLEMS. A case course in the problems of supervision of employees, and the personnel policies which promote productive efficiency. *Prerequisite: Economics* 155. (2) II (Carter)

200–BUSINESS ECONOMICS. The interrelations of economic laws with the social, political and legal framework of business, especially from the point of view of the industry and of the firm. (3) I (Sullivan)

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

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

204–SURVEY OF ECONOMIC THEORY SINCE THE AUSTRIAN SCHOOL. This course is virtually a continuation of course 203. (3) II (Hargreaves)

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 problems intensively examined. (2 ea.) 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 theor of statistical averages, the application of advanced statistical methods to economic data; th testing of economic theory. *Prerequisite: an elementary course in statistics.* (2) II (Massie)

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

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

218a, b—ECONOMIC THEORY. An intensive course covering the whole field of co temporary economic theory and the various analytical techniques used therein. *Prerequisit Economics* 52. (3 ea.) I, II (Haynes)

255—ADVANCED PERSONNEL MANAGEMENT. A critical examination of the pri ciples, methods, policies and procedures related to the effective utilization of human resourc in business concerns, consideration being given to mutual relationships. (3) II (Carter)

256—RESEARCH AND REPORT WRITING. Investigations of business problem sources, procedures, analysis, and presentation. (3) I (Haynes)

285—GOVERNMENT FINANCE ADMINISTRATION. Government budget; accoun ing, debt, purchasing, treasury, revenue, and auditing administration are examined; illustra tions are drawn from federal, state and local experience. Each student makes a speci report on finance-management or experience. (3) II (Martin)

IV. EDUCATION

GENERAL STATEMENT OF REGULATIONS GOVERNING GRADUATE WORK IN THE COLLEGE OF EDUCATION

Work leading to the doctoral degree with a major in education must conform to the same rules and regulations as prescribed in the general requirements, pages 13, 14, 20-24 of this Bulletin. In addition, two other requirements are prescribed by the College of Education for all doctoral candidates. First, students must be in full-time residence for at least one regular semester, and preferably one full year, during the course of their work at the University. Second, no person will be considered as a candidate for the doctoral degree with a major in education unless he has completed three years of successful teaching experience.

There are two plans of work leading toward the degree of Master of Arts in Education. Plan II, which follows, is permissible only with the approval of the Graduate School and the Dean of the College of Eeducation.

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 15 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. No student may satisfy more than one-half of the residence requirements for advanced degrees by part-time work. This limitation does not apply to intensive courses.
6. The total number of credits presented in education, undergraduate and graduate, must be at least 30 semester hours.
7. A standing of 3.0 (an average of B) or better must be made on all graduate work.
8. Six semester hours and nine weeks of residence may be done with the permission of the student's adviser and the dean of the Graduate School in extension classes, off-campus study, or independent work courses.
9. Oral and written final examinations will be required of all candidates for the degree of Master of Arts in Education. These examinations are to be taken just prior to or during the session in which the degree is to be conferred.
10. All graduate students must meet the requirements for a teaching certificate in Kentucky as established by the State Department of Education of Kentucky. These requirements are outlined in the General Catalog of the University. If deficiencies are found, they should be overcome before proceeding with graduate work. The work required to overcome these deficiencies is in addition to the minimum graduate requirements for the degree.

Plan II

1. A minimum of 30 semester hours of graduate work must be complete
2. At least 12 semester hours of graduate work must be in education.
3. At least 15 semester hours must be in courses numbered 200 or highe
4. At least 36 weeks must be spent in residence at the University of Ke tucky as a graduate student.
5. No student may satisfy more than one-half of the residence requiremen for advanced degrees by part-time work. This limitation does not appl to intensive courses.
6. The total number of credits presented in education, undergraduate an graduate, must be at least 30 semester hours.
7. A standing of 3.0 (an average of B) or better must be made on a graduate work.
8. Six semester hours and nine weeks of residence may be done with th permission of the student's adviser and the dean of the Graduate Scho in extension classes, off-campus study, or independent work courses.
9. Oral and written final examinations will be required of all candidat for the degree of Master of Arts in Education. These examinations a to be taken just prior to or during the session in which the degree is t be conferred.
10. All graduate students must meet the requirements for a teaching ce tificate in Kentucky as established by the State Department of Educa tion of Kentucky. These requirements are outlined in the Gener Catalog of the University. If deficiencies are found, they should b overcome before proceeding with graduate work, and in addition to th minimum 30 graduate credits required for the degree.

Each student's graduate curriculum must be a well-rounded program courses related to the student's major interest and approved by his committe In cases of deficient preparation the committee, with the approval of the Dea determines prerequisite undergraduate courses to be taken. The following pe sons have been designated to guide graduate students in their work toward t master's degree in education:

Area	
Elementary Teachers	Duncan, Ginger, Harris, Moore
Secondary Teachers	
General	Hartford, Sorenson, Adams, Ginger
Agriculture	Hammonds, Tabb, Wall
Art	Ginger, Haines, Weismann
Business Education	Musselman, Thomas, Humphreys
Home Economics	Parker, Sneed
Industrial Education	Baker, Youmans
Music	Lewis, Ginger, Worrel
Physical Education	Ginger, Seaton, Clay, Carr
Elementary Principal	Duncan, Harris, Ginger, Moore, Eckel
Secondary Principal	Hartford, Meece, Eckel
Supervisor	Adams, Harris, Meece
Attendance Officer	Meece, Eckel
Superintendent	Meece, Eckel

Suggested Graduate Curricula

		Semester Hours
For Superintendents		
Ed 200a, b	Philosophy of Education	3
Ed 201	Foundations in Education	5
Ed 202	Local School Administration	3
Ed 203	Constitutional and Legal Basis of Public School Administration	3
Ed 207	School Buildings and Equipment	3
Ed 212	The Elementary School	3
Ed 213	State School Administration	3
Ed 214	The Secondary School	3
Ed 220	Comparative Education	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
Ed 230	Educational Sociology	3
Ed 231	Business Administration and Finance of Public Education	3
Ed 232	High School Administration	3
Ed 255a	Guidance and Counseling in Today's Schools	3
For Principals		
Ed 201	Foundations in Education	5
Ed 212	The Elementary School	3
Ed 214	The Secondary School	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
Ed 232	High School Administration	3
Ed 255a	Guidance and Counseling in Today's Schools	3
For Supervisors and Helping Teachers		
Ed 201	Foundations in Education	5
Ed 202	Local School Administration	3
Ed 212	The Elementary School	3
Ed 214	The Secondary School	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
Ed 232	High School Administration	3
For Critic Teachers on the Elementary Level		
Ed 201	Foundations in Education	5
Ed 212	The Elementary School	3
Ed 224	Organization and Supervision of Student Teaching	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
For Critic Teachers on the Secondary Level		
Ed 201	Foundations in Education	5
Ed 214	The Secondary School	3
Ed 224	Organization and Supervision of Student Teaching	3
Ed 225	Supervision of Instruction	3
Ed 227	Principles of Curriculum Construction	3
Ed 232	High School Administration	3
For High School Teachers Majoring in Education		
Ed 201	Foundations in Education	5
Ed 214	The Secondary School	3
Ed 227	Principles of Curriculum Construction	3
Ed 254	Problems in Educational Psychology	3
Ed 255a, b	Guidance and Counseling in Today's Schools (each)	3
For Elementary Teachers Majoring in Education		
Ed 201	Foundations in Education	5
Ed 212	The Elementary School	3
Ed 227	Principles of Curriculum Construction	3
Ed 229	The Elementary Principal	3
Ed 254	Problems in Educational Psychology	3
For Music Majors		
Ed 201	Foundations in Education	5
Ed 242	Administration and Supervision of Public School Music	3
Ed 243	Advanced Methods and Materials in Music Education	2
Ed 253	History and Philosophy of Music Education	2
Ed 254	Problems in Educational Psychology	3

For Business Education Majors

Ed 201	Foundations in Education	5
Ed 208a	Problems in Business Education	3
Ed 255a	Guidance and Counseling in Today's Schools	3
Ed 256	The Social Business Subjects in High School	3
Ed 257a	Seminar in Business Education	3
Ed 259	The Commerce Curriculum	3
Ed 271	Administration and Supervision of Business Education	3

For Agricultural Education Majors

Ed 201	Foundations in Education	5
Ed 214	The Secondary School	3
Ed 227	Principles of Curriculum Construction	3
Ed 280	Method in Teaching Vocational Agriculture	3
Ed 287b	Selecting Teaching Materials	3
Ed 287c	Adult-Farmer Schools	3
Ed 287d	Directing Farm Practice	3
Ed 287f	Young-Farmer Schools	3

For Home Economics Education Majors

Ed 261	Supervision in Home Economics Education (For Supervision of Student Teachers)	3
Ed 263	Current Problems in Home Economics Education	3
Ed 264	Modern Trends in Home Economics Education	3
Ed 268	Home Economics Curriculum Construction	3
Ed 269	Evaluation in Home Economics Education	3
Ed 265 or 222	Research in Home Economics Education	3

For Industrial Education Majors

Ed 171a, b	Principles and Philosophy of Industrial Education	(each) 3
Ed 123	Vocational Guidance	3
Ed 183a, b	Methods in Industrial Education	(each) 3
Ed 134	Organization and Operation of Part-Time and Evening Classes	3
Ed 214	The Secondary School	3
Ed 201	Foundations in Education	5
Ed 232	High School Administration	3
Ed 227	Principles of Curriculum Construction	3

GRADUATE COURSES IN EDUCATION

DIVISION OF ADMINISTRATION

101—SCHOOL ORGANIZATION. Scope and general character of the American pu lic school system and organizational and administrative problems as they relate to the w of the classroom teacher. (3) I, II, S (Eckel

198—THE ADMINISTRATION OF PUPIL PERSONNEL. Administrative proble relating to child accounting, including school census, attendance records and reports, so and economic factors affecting school attendance, and duties and responsibilities of sch and non-school personnel and agencies. (3) I

202—LOCAL SCHOOL ADMINISTRATION. The organization, management, control of a local school system, including such problems as federal, state, and local relati ships, board of education, pupil personnel, employed personnel, public relations, finance business management, and school services. (3) I, II, S (Meece

203—CONSTITUTIONAL AND LEGAL BASIS OF PUBLIC SCHOOL ADMIN TRATION. A study of court decisions to discover the legal principles involved in pract problems of school administration. *Prerequisites: Education* 202, 213, *or* 232. (3) II, S (Meece

207—SCHOOL BUILDINGS AND EQUIPMENT. Measurement and evaluation existing school building facilities, planning new buildings, determining suitable equipm and financing the building program. *Prerequisite: Education* 202 *or its equivalent.* (3

209a, b—INTERNSHIP IN EDUCATIONAL ADMINISTRATION. Field experie are provided for prospective administrators under the cooperative supervision of Univer personnel and principals, supervisors, and superintendents in Kentucky public school tems. (3) I, II,

210a, b—INDEPENDENT WORK IN SCHOOL ADMINISTRATION. Research a practical problem in school administration. Open only to students with at least one mester of graduate work in education. Approval of instructor necessary before registra (3) I, II (Staf

213—STATE SCHOOL ADMINISTRATION. Organization, administration, and trol of education at the state level, including state-federal and state-local school relations state support, control of the material environment, training and certification of teach teachers' contracts, tenure, retirement. (3)

221a, b—SEMINAR IN ADMINISTRATION. A critical study of selected problems in school administration. The course is designed primarily for students who have had some administrative experience. *Prerequisites: Education* 202 *and* 225.
(3) II, S (Meece, Adams, and Eckel)

229—THE ELEMENTARY PRINCIPAL. Problems involved in the organization and administration of a modern elementary school. (3) I, S (Duncan and Harris)

231—BUSINESS ADMINISTRATION AND FINANCE OF PUBLIC EDUCATION. A course for prospective superintendents. Emphasizes school support, including state, local, and federal revenues; budgetary policy; procedures for purchasing, accounting, and reporting costs; management of funds, property, equipment, and supplies; payroll procedures, records, and reports. (3) II, S (Meece)

232—HIGH SCHOOL ADMINISTRATION. This course deals with organization, administration, and problems of the modern secondary schools, including such specific problems as school staff, program of studies, records and reports, school-community relationships, school plant, finance, and scheduling. (3) I, II, S (Eckel)

233—THE ADMINISTRATION OF THE TEACHING PERSONNEL. The course emphasizes principles and practices in teacher preparation, selection, and placement. Includes a study of salaries, tenure, retirement, teaching loads, sick leave, personnel records, and teacher participation in school administration problems. (3)

238—TRENDS IN HIGHER EDUCATION. A survey of modern tendencies in higher education: scope and development, objectives, organization, administration, curricula, finance, faculty and student personnel. Designed primarily for prospective college administrators, teachers, and registrars. (3) (Dickey and Chamberlain)

276—ADMINISTRATIVE PROBLEMS IN TODAY'S EDUCATION. A study of present-day administrative problems. The course is designed to be of assistance particularly to superintendents. (3) (Meece)

290a, b—TECHNIQUE AND PROFESSIONAL WORK OF THE REGISTRAR. A comprehensive study of the work of the registrar in institutions of higher education, including the history, literature, and present-day tendencies; rules of the University, recommendations of the American Association of College Registrars. (3) I, II, S (Mills)

301a, b—RESEARCH PROBLEMS IN EDUCATIONAL ADMINISTRATION. An independent research course for the study of special problems in educational administration. *Prerequisites: one year of graduate work.* (3) I, II, S (Meece)

321a, b—RESEARCH PROBLEMS IN HIGHER EDUCATION. An independent research course for the study of special problems in higher education. *Prerequisites: one year of graduate work.* (3) I, II, S (Dickey, Chamberlain, Mills)

DIVISION OF FOUNDATIONS OF EDUCATION

119—THE ELEMENTARY SCHOOL PUPIL. The psychology of the child in the primary and intermediate grades. *Prerequisite: one course in 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 and Martin)

132a, b—INTERGROUP RELATIONS. Analysis of relationships between groups which differ in religious, ethnic, or socio-cultural backgrounds; the development of educational and social techniques for reduction of tensions. (Same as Sociology 132a, b) (3) S (Staff)

147—THE SECONDARY SCHOOL PUPIL. The psychology of the pupil in junior and senior high school. *Prerequisite: one course in Psychology.*
(2) II, S (Sorenson and Reed)

148—EDUCATIONAL PSYCHOLOGY. Application of psychology to the problems of learning and teaching. (3) I, II, S (Sorenson)

151—THE TEACHING OF HIGHER LEVEL STUDY SKILLS. A course designed to demonstrate the teaching of study skills (including remedial work) in secondary schools. One approach to teaching these skills will include the study problems of college students.
(3) I, S (Sorenson and Martin)

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. An intensive study in various fields which contribute to the development of educational theory and practice.
(5) I, S (Hartford and Sorenson)

205—REVIEW OF CURRENT EDUCATIONAL LITERATURE. An extensive study of current educational literature as found in educational periodicals. *Prerequisite: 12 semester hours in education.* (3) II, S (Hartford)

217—GENERAL HISTORY OF EDUCATION. A survey of the history of education from the Greek period to the present. (3) (Hartford)

218—HISTORY OF EDUCATION IN THE UNITED STATES. A history of the growth and development of education in the United States from earliest Colonial times to the present, including recent movements and trends. (3) (Hartford)

219—HISTORY OF EDUCATIONAL THOUGHT. A study of the lives and writings of the world's educators to acquaint the student with the ideals and contributions to society of great educators. (3) I, S (Hartford)

220—COMPARATIVE EDUCATION. Comparisons of modern national systems of education. (3) II, S (Hartford)

222—METHODOLOGY OF EDUCATION RESEARCH. A course intended to acquaint the student with the various techniques of research and to aid him in methods of attack on his own particular research problems. *Prerequisite: 12 semester hours in education.* (3) II (Sorenson)

223—EDUCATIONAL STATISTICS. A 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 (Hartford and Staff)

230—EDUCATIONAL SOCIOLOGY. A course in sociological foundations of education. (3) II, S (Hartford)

237a, b—INDEPENDENT WORK IN HISTORY OF EDUCATION. Independent work problems and topics for advanced students in history of education. (3) I, II, S (Hartford)

241a, b—SEMINAR IN FOUNDATIONS OF EDUCATION. A critical study of selected problems in the foundations of education areas. (3) S (Hartford)

247a, b—INDEPENDENT WORK IN THE 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 psychological theories and research applicable to educational practices. *Prerequisite: one year of psychology.* (3) II, S (Sorenson)

255a, b—GUIDANCE AND COUNSELING IN TODAY'S SCHOOLS. A course for those concerned with an effective program of guidance; deals with principles and techniques for the formulation and evaluation of a complete guidance program including inventories, counseling, placement, and follow-up. (3) S (Martin)

285a, 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 and Martin)

260—PROBLEMS IN EDUCATIONAL SOCIOLOGY. An advanced course in the application of sociological findings to education including consideration of Southern regional problems and potentialities. *Prerequisites: 12 semester hours of graduate work including Education 230 or equivalent.* (3) S (Hartford)

275—ADVANCED PROBLEMS IN PHILOSOPHY OF EDUCATION. A critical study of philosophical problems which relate to present day education. *Prerequisites: teaching experience and 6 semester hours in philosophy of education.* (3) (Hartford)

DIVISION OF INSTRUCTION

Business Education

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

158a—TEACHING SECRETARIAL SUBJECTS. Special techniques and devices for teaching shorthand, typewriting, and secretarial office practice. Required of business education majors. (3) II, S (Musselman)

158b—TEACHING BOOKKEEPING AND ACCOUNTING. Methods, materials, and techniques used in the teaching of bookkeeping and accounting. (3) I, S (Musselman)

184—TEACHING OFFICE APPLIANCES. Methods and materials used in teaching the various office appliances. Dictating machines, mimeographs, mimeoscopes, addressing machines, filing devices, calculating machines, and other office appliances are used. (2) II, S (Musselman)

192—TEACHING GENERAL BUSINESS SUBJECTS IN THE SECONDARY SCHOOLS. The aims and purposes of the general business courses are studied. Analysis is made of the objectives of the general business subjects, and methods and materials used in teaching them are emphasized. (2) II, S (Musselman)

194—TEACHING CONSUMER COURSES IN THE HIGH SCHOOL. Methods, materials, and techniques of teaching high school pupils the various aspects of consumer education. Emphasis is placed on procedures and the student should have a background of training in economics before taking the course. (3) I, S (Musselman)

208a-d—PROBLEMS IN BUSINESS EDUCATION. A study of advanced problems of interest to business teachers such as testing in business subjects, guidance, job studies, placement and follow-up, equipment, and supervision. (3) I, II, S (Musselman)

256–THE SOCIAL BUSINESS SUBJECTS IN HIGH SCHOOL. An examination of the various social business subjects to determine their contribution to the objectives of business education. (3) I (Musselman)

257a, b–SEMINAR IN BUSINESS EDUCATION. A study of current literature in business education with special reference to trends in this field. (1) I, II, S (Musselman)

259–THE COMMERCE CURRICULUM. A study of business subjects offered in the high school to determine their content and the place each should occupy in high school curricula. A course of study is developed for each subject. (3) II, S (Musselman)

270–BUSINESS EDUCATION IN COLLEGES AND UNIVERSITIES. Consideration of the problems pertaining to the teaching of business subjects at the college level. Consideration is also given to the development of curricula to meet teacher certification requirements in various states. (3) S (Musselman)

271–ADMINISTRATION AND SUPERVISION OF BUSINESS EDUCATION. Duties and responsibilities of city and state supervisors, department heads, and others engaged in directing business education. (3) II, S (Musselman)

272a, b–INDEPENDENT WORK IN BUSINESS EDUCATION. An independent work course for students who have done a minimum of 12 semester hours of graduate work, one-half of which must have been in business education. (3) I, II, S (Musselman)

273–CLASSIFICATION AND POSSIBLE USE OF COMMUNITY RESOURCES IN BUSINESS EDUCATION. Course provides for community analysis, and the development of possible ways and means to supplement the business education course in the secondary school with a study of vital community resources. (3) I, S (Musselman)

Curriculum and Instruction

107–SAFETY EDUCATION. A course designed to aid in developing skills and techniques essential to improving automotive and pedestrian safety. Psycho-physical tests, classroom work, behind-the-wheel driving, and other basic safety education are presented. (3) S (Ginger)

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

175a-f–MODERN EDUCATIONAL PROBLEMS. A brief survey of some of the problems in modern education. (3) (Staff)

175g–MODERN EDUCATIONAL PROBLEMS: EDUCATION OF HANDICAPPED CHILDREN. Procedures to be used in the education of children who are handicapped physically, mentally, or emotionally. Attention is given to work with individual children as well as with groups. (3) (Staff)

175i–MODERN EDUCATIONAL PROBLEMS: COMMUNITY ORGANIZATION IN ADULT EDUCATION. Problems of community organizations as they affect the adult life of citizens of the community served. (3) (Staff)

175j–MODERN EDUCATIONAL PROBLEMS. A brief survey of some of the problems in modern education. (3) (Staff)

186–VISUAL TEACHING. A course in methods and techniques of visual instruction. Emphasis is on the effective use of films, film strips, pictures, maps, graphs, slides, field trips, by means of lesson plans. Surveys are made of visual materials. (3) I, II, S (Staff)

206–PROBLEMS OF COLLEGE TEACHING. Methods commonly used in college teaching, bases for measuring instruction, marking systems, qualifications for college teaching, and efforts being made to improve college instruction. (3) (Staff)

224–ORGANIZATION AND SUPERVISION OF STUDENT TEACHING. A course designed for teachers preparing to become supervising teachers. The basic principles apply to both elementary and secondary education. Includes a presentation of the experiences deemed important in dveloping students into effective teachers. (3) S (Ginger)

225–SUPERVISION OF INSTRUCTION. Development, purposes, and organization of supervisory programs. Special emphasis on the nature of educational leadership. Consideration of various approaches to supervision with special attention to current in-service educational programs. (3) II, S (Adams)

226a-f–PROBLEMS OF THE SCHOOL CURRICULUM. Problems in the field of the school curriculum and in the preparation of instructional materials. Students enrolling in this course are required to leave on file with the College of Education a complete report of each problem studied. (3) (Staff)

227–PRINCIPLES OF CURRICULUM CONSTRUCTION. Study of basic principles of curriculum development. Relationship of social and psychological factors to curriculum change. Survey of current approaches to curriculum organization. Consideration of means of curriculum development in school systems. (3) (Musselman and Adams)

234–PROBLEMS OF CURRICULUM MAKING. The selection of materials in the elementary and secondary fields, types of units used in modern instruction, and the various educational agencies that may be used to make the school a real community center. (3) I (Musselman)

245–ORGANIZATION OF AUDIO-VISUAL AIDS. Operation of an audio-visual program considering budgeting, training of personnel, duties of staff, sources of materials, and use of equipment. Previews are made of many audio-visual materials. (3) II (Ginger and Staff)

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)

249—EXTRACURRICULAR ACTIVITIES. The underlying principles and common practices of the co-curricular activities programs as developed in public schools. Home room activities, assembly programs, and clubs are the three major sections of the course; other activities included when necessary. (3) S (Ginger)

292a, b—FIELD PROBLEMS IN CURRICULUM AND SUPERVISION. A course designed to provide direct experience in dealing with educational problems in field situations. Observations, readings, and research also required. Registration only with consent of instructor. (3) I, II (Dickey and Adams)

305a, b—RESEARCH PROBLEMS IN CURRICULUM AND SUPERVISION. An independent research course. Students confer individually with the instructor. *Prerequisite: one year of graduate work.* (3) I, II (Dickey and Adams)

Elementary Education

110—ADVANCED ARTS AND CRAFTS 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)

141—PROBLEMS IN DIAGNOSTIC AND REMEDIAL READING. Prevention, diagnosis and corrective measures for reading difficulties. Study of investigations and literature in this field. (3) (Duncan)

172—THE TEACHING OF READING. A study of major factors in learning to read. Objectives, readiness, abilities needed for silent and oral reading. Methods of word attack, diagnostic and corrective techniques. Testing and materials for each level. (3) II (Duncan)

173—CHILDREN'S LITERATURE. Planned to acquaint students with literature for children, kindergarten through grade 8. Review of interests at different ages. Discussion of types of literature—folklore, modern fairy tales, myths and legends, realistic stories, biography 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. Regular periods are scheduled for observing and participating in the kindergarten. (3) I (Burke)

196—SCIENCE IN THE ELEMENTARY SCHOOL. A background of elementary science usable with children in the first six grades. 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 (Moore)

212—THE ELEMENTARY SCHOOL. Recent research and modern trends in teaching the skills and content subjects in the elementary school. Planned for supervisors, superintendents, principals, and teachers for better understanding of a modern elementary school. (3) II (Duncan, Harris and Moore)

215a, b—INDEPENDENT WORK IN ELEMENTARY EDUCATION. An independent work course for students who have done a minimum of 12 semester hours of graduate work including Education 212 or 229. (2) I, II (Duncan, Harris, and Moore)

239—A SURVEY OF RESEARCH IN HUMAN DEVELOPMENT AND EDUCATION. A study of the research and principles of education and allied fields which are appropriate to a consideration of education as a developmental process. *Prerequisite: Master's degree or by permission.* (4) II (Harris)

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

Music Education

242—ADMINISTRATION AND SUPERVISION OF PUBLIC SCHOOL MUSIC. A study of current trends in school music, curricula, testing programs, and other supervisory procedures. (3) (Worrel)

243—ADVANCED METHODS AND MATERIALS IN MUSIC EDUCATION. Survey and evaluation of new public school music methods and materials. (2) (Worrel)

244—HISTORY AND PHILOSOPHY OF MUSIC EDUCATION. A course designed to acquaint the student with the historical developments and basic philosophies in public school music. (2) (Worrel)

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 (Reed)

111–THE TEACHING OF READING IN THE JUNIOR AND SENIOR HIGH SCHOOLS. The diagnosis and corrective measures for junior and senior high schools. Study of plans of organizing a corrective program and suitable materials. (2) (Duncan)

214–THE SECONDARY SCHOOL. A course designed to acquaint the secondary teacher and the administrator with the nature and function of the secondary school. (3) I, II, S (Adams)

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 (Dickey, Ginger, and Adams)

307a, b–RESEARCH PROBLEMS IN SECONDARY EDUCATION. An independent research course. Students confer individually with the instructor. *Prerequisite: one year of graduate work.* (3) I, II, S (Ginger and 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, and Wall)

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, Binkley and Wall)

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, and Wall)

188–FARM PRACTICE SUPERVISION. Practice and directed study in supervising farming programs in vocational agriculture. (1) I, II, S (Hammonds, Tabb)

280–METHOD OF 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, 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 (Wall)

289a, b–RESEARCH IN AGRICULTURAL EDUCATION. Individual problems of importance to agricultural education. (3) I, II, S (Hammonds, Tabb, Wall)

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. Class work on problems of the coordinator of a high-school program in distributive education, including selecting students for the program, placing students in stores, rating students, use of advisory committee, and over-all planning. (3) I, II, S (Baker)

128—TECHNIQUE OF TEACHING DISTRIBUTIVE EDUCATION. A study of the methods of teaching as applied to distributive education. The purpose of the course is to train prospective teachers to teach in the field of distributive education. (3) I, II, S (Baker)

Home Economics Education

160—TECHNIQUE OF TEACHING HOME ECONOMICS. A study of methods of teaching as applied to home economics. *Prerequisites: Home Economics* 26, 27, *and* 61; *and Education* 147. (3) I, II (Parker)

165—ADULT EDUCATION IN HOME ECONOMICS. Problems in teaching vocational homemaking in day, part-time, and evening schools. *Prerequisite: Education* 160. *Prerequisite (or to be taken concurrently): Education* 162. (3) I, II, S (Parker, Averitt, Smith, Sneed)

166a-d—PROBLEMS IN HOME ECONOMICS EDUCATION. Problems in teaching home economics for high school students and adults. The course may include such subjects as teaching in, and supervision of, the school community cannery and the teaching of housing. (3) S (Parker, Sneed)

261—HOME ECONOMICS SUPERVISION. A course planned primarily to help prepare teacher-trainers and supervisors of home economics education. *Prerequisites: Education* 160 *and* 162; *teaching experience; and permission of instructor.* (3) I, S (Parker, Sneed)

263—CURRENT PROBLEMS IN HOME ECONOMICS EDUCATION. Recent developments in home economics education. *Prerequisites: Education* 160 *and* 162; *teaching experience.* (3) II, S (Parker, Sneed)

264—MODERN TRENDS IN HOME ECONOMICS EDUCATION. A basic course for students in home economics education. The course includes the development of home economics education and modern trends in curriculum, methods of teaching, and evaluation. (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, Sneed)

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. This course includes practice in teaching for observation by others, student teaching, and school visiting. *Prerequisites: two years of teaching experience and Education* 261. (3) I, II (Parker, Sneed)

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. Course content includes units on aims and purposes, individual inventory, and counseling techniques. Emphasis is placed on occupational information and guidance, placement, follow-up, and organization and administration of guidance program. (2) I, II, S (Youmans)

134—ORGANIZATION AND OPERATION OF PART-TIME AND EVENING CLASSES. A course for administrators, coordinators, and teachers in part-time and evening industrial education. Covers the duties of a coordinator in cooperative training programs. (2) I, II, S (Youmans, Baker)

136—SURVEYS IN INDUSTRIAL EDUCATION. This course deals with the basic methods and techniques used in making a survey to determine the needs for trade and industrial education. How to gather, evaluate, and interpret the data are emphasized. (2) I, II, S (Youmans)

137—SPECIAL PROBLEMS IN INDUSTRIAL EDUCATION. The supervised study of approved problems in industrial education on a research basis. (2) I, II, S (Youmans, Baker)

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 (Youmans)

171a, b—PRINCIPLES AND PHILOSOPHY OF INDUSTRIAL EDUCATION. A course planned primarily for the advanced student in industrial education. It covers the general philosophy of vocational education as it relates to the problems and principles of industrial education. (2) I, II, S (Youmans, Baker)

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 (Youmans, Baker)

Vocational Education

211—THE ADMINISTRATION OF VOCATIONAL EDUCATION. A course designed for superintendents, high-school principals, and other administrators. Its purpose is to train for administering and supervising vocational education in schools. (3) I, II (Hammonds, Dickey)

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)

286a, b—SEMINAR IN VOCATIONAL EDUCATION. A critical study of selected problems in vocational education. The course is open only to students with experience in the field. (2) I, II, S (Hammonds, Parker, and Baker)

V. ENGINEERING

Students desiring to take any of the following courses should have the prerequisites indicated in each case. Courses numbered 200 and above are offered to graduates and to such practicing engineers as may be qualified to pursue them. A thorough working knowledge of chemistry, physics, and mathematics is necessary. For credit toward an advanced degree, a candidate must hold a baccalaureate degree in the division of engineering in which he is registered, or its equivalent.

Graduate work on the master's level is conducted in all engineering departments. Doctoral work is offered in physical metallurgy.

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. *Prerequisite: senior classification.* (3) I, II (Elsey)

Applied Mechanics

100—STRENGTH OF MATERIALS. A study of stress and strain due to direct forces, shear, bending, torsion, eccentric loads and combined stresses. Lecture and recitation, four hours. *Prerequisites: Appl. Mech.* 3 *and Math.* 20*b*. (4) I, II, S (Hawkins, Barber, and Adams)

106—ADVANCED STRENGTH OF MATERIALS. Unsymmetrical bending of beams, thin plates, stress analysis of thick walled cylinders, and rotating discs. Theory of elastic energy, curved beams, stress concentration, and fatigue. Lecture and recitation, three hours. *Prerequisite: Appl. Mech.* 100. (3) I, II, S (Hawkins and Adams)

107—MECHANICAL VIBRATIONS. Vibrations of systems of one and several degrees of freedom, critical speeds, and torsional and lateral vibrations of shafts. Lecture and recitation, four hours. *Prerequisites: Appl. Mech.* 4 *or* 7, *and* 100. *Prerequisite (or to be taken concurrently): Math.* 35. (4) I, II (Hawkins and Barber)

Engineering Drawing

115—PHOTOGRAPHY. (For Engineers.) Lectures on the optics and chemistry of photography together with practical demonstrations. Lecture, one hour; laboratory, four hours a week. *Prerequisites: Chem.* 1*a and Phys.* 3*a, junior standing.* (3) I (Nollau)

Fire Protection and Safety Engineering

101a—FIRE PROTECTION ENGINEERING. A study of building materials and construction relative to fire prevention and the analysis of common fire hazards. Lecture and recitation, two hours a week. *Prerequisite: junior classification.* (2) I (Gard)

101b—FIRE PROTECTION ENGINEERING. A study of special fire hazards, principles of fire insurance ratings, and laws and ordinances governing fire prevention and protection. Lecture and recitation, two hours a week. *Prerequisite: junior classification.* (2) II (Gard)

101c—FIRE PROTECTION ENGINEERING. A study of fire protection methods including water supply, fire fighting equipment, town grading, alarm systems and special extinguishing devices. Lecture and recitation, two hours a week. *Prerequisite: junior classification.* (2) I (Gard)

102—SAFETY ENGINEERING. A study of safety methods including industrial accident prevention, accident statistics and analysis, industrial safety hazards, protective equipment, transportation and general safety. Lectures and recitation, two hours a week. *Prerequisite: junior classification.* (2) II (Gard)

CIVIL ENGINEERING

107–SOIL MECHANICS. A study of soil and its utilization in foundations for structures and subgrade for highways. Stabilization and improvement of bearing values. Lectures and recitations, two hours a week; laboratory, three hours. *Prerequisite: junior classification. Prerequisite (or to be taken concurrently): Geol.* 12*b*. (3) I, II (Pendley)

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. Engr.* 171*a*. (4) I, II (Leggett)

110b–REINFORCED CONCRETE. Continuation of Civ. Engr. 110a, with special emphasis on complete structures. Lecture and recitation, two hours; drawing room, three hours. *Prerequisite: Civ. Engr.* 110*a*. (3) I, II (Mory)

114–ADVANCED SURVEYING. Methods of geodetic surveying and adjustment of observations, map projections. Plane table surveys. Introduction to aerial photography. Class work, two hours; field work, three hours. *Prerequisite: summer camp.* (3) I, II (Blythe)

115–ENGINEERING INTERPRETATION OF AERIAL PHOTOGRAPHS. Fundamentals of aerial photography as applied to modern engineering surveys. Analysis and reports on soil pattern, geologic formations, and land use studies using photographs. Lecture and recitation, two hours; laboratory, three hours. *Prerequisite: Consent of instructor.* (3) I (Blythe)

120–HYDRAULICS. Mechanics of fluids under static and dynamic conditions. Fundamentals as found in any standard elementary textbook. Lecture and recitation, two hours. *Prerequisites: Appl. Mech.* 4 *and* 100. (2) I, II, S (Cheek)

123–HYDRAULICS LABORATORY. Experimental investigation and application of some of the more important principles covered in Civ. Engr. 120. Laboratory, three hours. *Prerequisite (or to be taken concurrently): Civ. Engr.* 120. (1) I, II, S (Cheek)

126–HYDROLOGY. Occurrence, control and utilization of water particularly as a problem of Civil and Sanitary Engineering. *Prerequisite: Civ. Engr.* 120.

130a–HIGHWAY ENGINEERING. Highway organization, administration, and finances. Planning and geometric design of highways. Soils, drainage, earthwork, soil stabilized and low type roads. Lecture, two hours; laboratory, three hours. *Prerequisite: Civ. Engr.* 107. (3) I, II (Pendley)

130b–HIGHWAY ENGINEERING. Materials, construction and maintenance of intermediate and high type roads including all types of bituminous surfaces, macadams and Portland cement concrete. Lecture, two hours; laboratory, three hours. *Prerequisite: Civ. Engr.* 130*a*. (3) I, II (Chambers)

151–WATER SUPPLY AND WATERWORKS. Rainfall and run-off, surface and underground sources of supply. The purification plant and its operation. Distribution and pressure problems. Pipe networks. Lecture and recitation, two hours. *Prerequisite: Civ. Engr.* 120. *Concurrent with Civ. Engr.* 152. (2) I, II (Cheek)

152–SEWERS AND SEWAGE DISPOSAL. Sanitary and storm sewers, flow problems. Disposal plants and their operation. Lecture and recitation, two hours. *Prerequisite: Civ. Engr.* 120. *Concurrent with Civ. Engr.* 151. (2) I, II (Cheek)

157–SANITARY ENGINEERING FOR HEALTH OFFICERS. For County Health Officers only. Stress is laid upon preventative rather than curative measures. The theory portion of Civ. Engr. 24 is included so the doctor will better understand the problems of the sanitarian. (2) S (Cheek)

158–SANITARY ENGINEERING DESIGN. For students now majoring in sanitary Engineering. Complete design and layout of a water plant, distribution system, storm and sanitary sewer, and sewage disposal plant. Drawing room, nine hours. *Prerequisites: Civ. Engr.* 151 *and* 152. (3) I, II (Cheek)

159–DESIGN AND OPERATION OF WATERWORKS AND SEWERS. General designs of water treatment and sewage disposal plants; distribution and collection systems; practice in the more common laboratory tests used in the plants. Lab. and drawing room, six hours. *Prerequisites: Civ. Engr.* 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 to be taken concurrently): Appl. Mech.* 100. (3) I, II (Leggett)

171b–THEORY OF STRUCTURES. Continuation of Civ. Engr. 171a with emphasis on indeterminate structures. Lecture and recitation, three hours. *Prerequisite: Civ. Engr.* 171*a*. (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. Engr.* 171*a*. (3) I, II (Mory)

173b–STEEL STRUCTURES. Continuation of Civ. Engr. 173a with emphasis on floor systems, trusses, and plate girders for bridges. Drawing room, six hours. *Prerequisite: Civ. Engr.* 173*a*. (2) I, II (Leggett)

174–GRAPHIC SOLUTION. 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 to be taken concurrently): Civ. Engr.* 171*a*. (2) I, II (Leggett)

182—SANITATION. Municipal and rural sanitation presented from an engineering viewpoint. Also includes problems in heating, lighting, plumbing and ventilation. *Prerequisite: Bact.* 57. (2) I, II (Cheek)

202a—ADVANCED REINFORCED CONCRETE STRUCTURES. Theory and application of condensed forms of stress analysis and design as applied to continuous unsymmetrical building frames. Lecture, three hours. *Prerequisites: Civ. Engr.* 171*b and* 110*b*. (3) (Mory, Leggett)

202b—ADVANCED REINFORCED CONCRETE STRUCTURES. Theory and application of the column analogy method of stress analysis and design as applied to members and continuous structures with emphasis on arches. Lecture, three hours. *Prerequisites: Civ. Engr.* 171*b and* 110*b*. (3) (Mory)

202c—ADVANCED REINFORCED CONCRETE STRUCTURES. Theory and application of stress analysis and design methods as applied to continuous unsymmetrical frames carrying horizontal loads; frames with haunched members and continuous arches on slender piers. Lecture, three hours. *Prerequisite: Civ. Engr.* 202*b*. (3) (Mory)

202d—ADVANCED REINFORCED CONCRETE STRUCTURES. Problems in the design and detailing of special structures, selected jointly by the student and instructor. Lecture, one hour; laboratory, four hours. *Prerequisite: Civ. Engr.* 202*c*. (3) (Mory)

221a, b—ADVANCED SOIL MECHANICS. Advanced study of the engineering properties of soils and the application of these theories to the design of engineering structures. Lecture, one hour; laboratory, four hours. *Prerequisite: Civ. Engr.* 107. (3 ea.) I, II (Gregg)

230a—ADVANCED HIGHWAY ENGINEERING. A study of highway administration, economics and finance, including sources and types of revenue, road costs, toll financing, classification of roads, benefits from improvement and program planning. Lecture, three hours. *Prerequisite: Civ. Engr.* 130*b or consent of instructor*. (3) (Gregg)

230b—ADVANCED HIGHWAY ENGINEERING. A study of traffic, planning and geometric design including traffic surveys, traffic control, parking and design consideration. Lecture, two hours; laboratory, two hours. *Prerequisite: Civ. Engr.* 130*a or consent of instructor*. (3) (Pendley)

230c—ADVANCED HIGHWAY ENGINEERING. Highway design, construction and maintenance, including physical aspects of design, drainage, road types, pavement design, construction methods and supervision, and maintenance methods. Lecture, three hours. *Prerequisite: Civ. Engr.* 232*a*. (3) (Gregg)

230d—ADVANCED HIGHWAY ENGINEERING. Origin, production, classification, and significant properties of bituminous materials, bituminous paving mixes, paints, metal products and miscellaneous materials used in the highway industry. Tests and application of test data. Lecture, two hours; laboratory, two hours. *Prerequisite: Civ. Engr.* 130*b*. (3) (Gregg)

120e—ADVANCED HIGHWAY ENGINEERING. Production, classification and significant properties of Portland and natural cements, mineral aggregates, and concrete paving mixtures. Tests and application of test data. Lecture, two hours; laboratory, two hours. *Prerequisite: Civ. Engr.* 130*b*. (3) (Gregg)

242a-d—RAILROAD ENGINEERING. Advanced course in location, construction, maintenance, economical selection of lines, grade reduction, cost of operation, valuation, and structures and their maintenance. Class work, one hour; laboratory, four hours. (3 ea.) I, II (Shaver)

252a-d—SANITARY ENGINEERING. Continuation of Civ. Engr. 159 covering more detailed design of various sanitary constructions. (Additional courses in chemistry, bacteriology, and zoology 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—ADVANCED STEEL STRUCTURES. Theory and application of the Williot and Mohr diagrams, Maxwell's law of reciprocal relations, virtual work and influence lines for determining deflections, movements and camber in design of continuous steel trusses and plate girders. Lecture, three hours. *Prerequisites: Civ. Engr.* 171*b and* 173*b*. (3) (Mory)

272b—ADVANCED STEEL STRUCTURES. Preparation of design drawings of structures analyzed and proportioned in Civ. Engr. 202a and 272a. Laboratory, four hours. *Prerequisites: Civ. Engr.* 202*a and* 272*a*. (2) (Leggett)

272c—ADVANCED STEEL STRUCTURES. Theory and application of stress analysis and design methods as applied to single and multi-span gabled frames and thin shells. Lecture, three hours. *Prerequisites: Civ. Engr.* 272*a and* 202*b*. (3) (Leggett)

272d—ADVANCED STEEL STRUCTURES. Theory and application of stress analysis and design as applied to suspension bridges. Lecture, two hours; laboratory, two hours. *Prerequisite: Civ. Engr.* 272*a*. (3) (Mory)

282a-f—SPECIAL PROBLEMS IN CIVIL ENGINEERING. Individual work on some selected problem in one of the various fields of Civil Engineering. Laboratory, six hours. *Prerequisite: approval of Head of Department.* (3 ea.) (Staff)

283a-d–SEMINAR. Review of current literature in the field of Civil Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two hours. (1 ea.) (Staff)

500-1, 2, 3–THESIS. (0) I, II, S (Staff)

ELECTRICAL ENGINEERING

101–FUNDAMENTALS OF ELECTRICAL MACHINERY. (For Civil, Metallurgical, and Mining Engineers.) A study of elementary direct current and alternating current circuits, machinery controls and illumination equipment. Two class hours; two hours laboratory. *Prerequisite: Phys. 3b.* (3) I, II (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. Two class hours. *Prerequisite: Elec. Engr.* 101. (2) II (Staff)

103–ELECTRICAL LABORATORY FOR MINING ENGINEERS. A laboratory study of circuits and equipment used in the servicing and operation of industrial equipment. With special emphasis on mining applications. Three hours laboratory. Concurrent with Elec. Engr. 102. (1) II (Staff)

105a–ELECTRICAL ENGINEERING CIRCUITS AND MACHINERY. (For Mechanical Engineers.) Study of electrical circuits and machinery and their control as found in modernly equipped installations. Three class hours; three hours laboratory. *Prerequisites: Phys. 3b. and Math. 20b.* (4) I (Boggess)

105b–ELECTRICAL ENGINEERING CIRCUITS AND MACHINERY. (For Mechanical Engineers.) Continuation of Elec. Eng. 105a. Three class hours; three hours laboratory. (4) II (Boggess)

107R–ELECTRICAL CONTROLS. Control of electric equipment. Types of contractors, relays, etc. Typical circuits with which they are tied together into units for automatic functioning. Recitation, two class hours. *Prerequisites: Elec. Engr. 116R, 116L, 105b or* 101. *Concurrent with Elec. Engr. 107L.* (2) I (Maney)

107L–ELECTRIC CONTROLS LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 107R. Laboratory, three hours. Concurrent with Elec. Engr. 107R. (1) I (Maney)

108R–INDUSTRIAL ELECTRONICS. Electronic devices for industrial use, and their applications in the control of rectifiers, motors and welders. High frequency heating, timing circuits, and oscillators; phototubes, etc. Recitation, two class hours. *Prerequisites: Elec. Engr. 116R, 116L, 161R, 161L. Concurrent with Elec. Engr. 108L.* (2) I, II (Romanowitz, Smith)

108L–INDUSTRIAL ELECTRONICS LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 108R. Laboratory, three hours. Concurrent with Elec. Engr. 108R. (1) I, II (Romanowitz, Smith)

111–ADVANCED ELECTRICAL LABORATORY. Laboratory, two hours. (1) I, II (Staff)

114R–ALTERNATING CURRENT CIRCUITS. A mathematical study of single phase and polyphase circuits under the influence of steady state sinusoidal and nonsinusoidal voltages. Recitation, three class hours. *Prerequisite (or to be taken concurrently): Elec. Engr. 21R, 21L, and Math. 20b. Concurrent with Elec. Engr. 114L.* (3) I, II (Graham)

114L–ALTERNATING CURRENT CIRCUITS LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 114R. Laboratory, three hours. Concurrent with Elec. Engr. 114R. (1) I, II (Graham)

115R–DIRECT CURRENT MACHINERY. A Study of D.C. Machinery, construction and design, and its operation and characteristics. Recitation, two class hours. *Prerequisites: Elec. Engr. 114R, 114L, Math. 20b. Concurrent with Elec. Engr. 115L.* (2) I, II (Barnett)

115L–DIRECT CURRENT MACHINERY LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 115R. Laboratory, three hours. Concurrent with Elec. Engr. 115R. (1) I, II (Barnett)

116R–ALTERNATING CURRENT MACHINERY. A study of A.C. machinery construction and its operation and characteristics. Recitation, three class hours. *Prerequisites: Elec. Engr. 114R, 114L, 115R, 115L. Concurrent with Elec. Engr. 116L.* (3) I, II (Barnett)

116L–ALTERNATING CURRENT MACHINERY LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 116R. Laboratory, three hours. Concurrent with Elec. Engr. 116R. (1) I, II (Barnett)

117–ADVANCED ALTERNATING CURRENT MACHINERY. Advanced analytical study of A.C. machinery characteristics. *Prerequisites: Elec. Engr. 116R, 116L.* (3) II (Maney)

118–ELECTRICAL POWER PLANT EQUIPMENT. A study of the electrical elements of a modern power plant and their operation and characteristics. *Prerequisites: Elec. Engr. 116R, 116L.* (3) I (Maney)

120—ELECTRIC CIRCUIT ANALYSIS. Mathematical and physical principles of engineering analysis. Analogies, duals. Steady state and transient solutions. Fourier and Laplace analyses. Dimensional analysis. Bessel and Hyperbolic functions, etc. Two class hours; two hours laboratory. *Prerequisites: Elec. Engr.* 114*R*, 114*L*, *and Math.* 35. (3) I, II (Smith)

123—ELECTRICAL EQUIPMENT PROBLEMS. (For Electrical Engineers.) Individual problems related to engineering practice are assigned. The solutions involve economic as well as engineering considerations. Lecture, one hour; five hours laboratory. *Prerequisites: Elec. Engr.* 116*R*, 116*L*, 120. (2) I, II (Boggess)

124—ELECTRICAL DESIGN. Fundamental relations in the design of electrical machinery. Includes the calculations for the design of several pieces of electrical equipment. Lecture, one hour; five hours laboratory. *Prerequisites: Elec. Engr.* 115*R*, 115*L*, 116*R*, 116*L*. (2) I, II (Barnett)

135R—NETWORKS AND LINES. Fundamentals of network theory in communication and power circuits. Network theorems, transmission lines and wave filters. Recitation, three class hours. *Prerequisites: Elec. Engr.* 114*R*, 114*L*, 120. *Concurrent with Elec. Engr.* 135*L*. (3) I, II (Allison, Graham)

135L—NETWORKS AND LINES LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 135R. Laboratory, three hours. Concurrent with Elec. Engr. 135R. (1) I (Allison, Graham)

136R—ILLUMINATION ENGINEERING. Spectral nature of light sources; entities in illumination systems; measurements and standards; design of interior and outdoor lighting systems. Recitation, two class hours. *Prerequisites: Physics* 3*b*, *Math.* 20*b*. *Concurrent with Elec. Engr.* 136*L*. (2) II (Maney)

136L—ILLUMINATION ENGINEERING LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 136R. Laboratory, three hours. Concurrent with Elec. Engr. 136R. (1) II (Maney)

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. *Prerequisites: Elec. Engr.* 120, 135*R*, 135*L*. (3) I, II (Maney)

139—TELEPHONY. The theory and practice of modern telephone operation. *Prerequisites: Elec. Engr.* 135*R*, 135*L*. (3) I (Staff)

151a, b—SEMINAR. Weekly meetings with staff for reports and discussion on research and modern trends and practices in Electrical Engineering. Two class 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 for students the character of whose previous work justifies it. (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 for students the character of whose previous work justifies it. (2 ea.) I, II (Staff)

161R—VACUUM TUBE ELECTRONICS. High vacuum and gas tube characteristics. Electronic circuits, rectifiers and smoothing filters. Audio amplifiers, oscillators. Electronic instruments. Recitation, three class hours. *Prerequisites: Elec. Engr.* 114*R*, 114*L*. *Concurrent with Elec. Engr.* 161*L*. (3) I, II (Fogel)

161L—VACUUM TUBE ELECTRONICS LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 161R. Laboratory, three hours. Concurrent with Elec. Engr. 161R. (1) I, II (Fogel)

162R—RADIO CIRCUITS. Resonance at radio frequencies; coupled circuits and impedance transformation; radio frequency amplifiers. AM and FM transmitters and receivers. Recitation, three class hours. *Prerequisites: Elec. Engr.* 161*R*, 161*L*. *Concurrent with Elec. Engr.* 162*L*. (3) I, II (Smith, Graham)

162L—RADIO CIRCUITS LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 162R. Laboratory, three hours. Concurrent with Elec. Engr. 162R. (1) I, II (Smith, Graham)

164R—RADIO AND TELEVISION CIRCUITS. High frequency phenomena: coupled circuits, impedance transformation, lines, antenna feeding and matching, wide band amplifiers, pulse circuits. Recitation, three class hours. *Prerequisites: Elec. Engr.* 162*R*, 162*L*, 135*R*, 135*L*. *Concurrent with Elec. Engr.* 164*L*. (3) I, II (Allison, Smith)

164L—RADIO AND TELEVISION CIRCUITS LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 164R. Laboratory, three hours. Concurrent with Elec. Engr. 164R. (1) I, II (Allison, Smith)

165—FIELDS AND WAVES. Fundamental theory of current, potential, power, and electric and magnetic fields. Vector analysis, Maxwell's equations. Plane waves, power flow and the Poynting vector. Two class hours. *Prerequisite: Elec. Engr.* 120. (2) I, II (Romanowitz)

172R—AUTOMATIC CONTROL SYSTEMS. Closed loop industrial control systems and system elements. Analysis of modes of operation. Stability, adjustment. Recitation, three class hours. *Prerequisites: Elec. Engr.* 102, 103 *or Elec. Engr.* 105*a*, 105*b or equivalent. Concurrent with Elec. Engr.* 172*L*. (3) I, II (Smith)

172L–AUTOMATIC CONTROL SYSTEMS LABORATORY. Laboratory practice and experiment exercises relating to studies in Elec. Engr. 172R. Laboratory, three hours. Concurrent with Elec. Engr. 172R. (1) I, II (Smith)

206–ELECTRIC POWER TRANSMISSION. The theory underlying the calculation and operation of long distance transmission circuits. Special attention to relay control. (3) (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. (3) (Staff)

211a–LINEAR CIRCUIT ANALYSIS I. Laplace and Fourier transform methods of analysis of linear lumped constant systems under transient and steady state conditions; feedback amplifiers; filter networks; stability and physical realizability. *Prerequisites: Elec. Engr.* 120, 135*R*, 135*L*. (3) (Smith)

211b–LINEAR CIRCUIT ANALYSIS II. Continuation of Elec. Engr. 211a with an introduction to non-linear systems. (3) (Smith)

212–SERVOMECHANISMS. Synthesis of closed loop systems. Transient and steady state analysis of system transfer functions. Laplace transform and loci plot methods. *Prerequisites: Elec. Engr.* 107*R*, 107*L*, 108*R*, 108*L*, 211*a*. (3) (Smith)

221–ELECTRON BEHAVIOR IN HIGH VACUUM AND GAS TUBES. Potential distribution, thermionic emission and electron flow; energy of electrons in meals; Maxwellian distribution equation and curves; random motions of electrons and ions. *Prerequisites: Elec. Engr.* 108*R*, 108*L*, 120. (3) (Romanowitz)

222–GASEOUS CONDUCTING ELECTRONIC DEVICES. Atomic energy level diagrams; photo-electric emission and devices; electric arcs and glow discharges, plasmas and boundaries, sheaths and probes; industrial devices. *Prerequisite: Elec. Engr.* 221. (3) (Romanowitz)

223–LINES AND WAVE GUIDES. Open wire and coaxial lines, reflections, standing waves; circle diagram; stub matching; impedance transformation, wave guides. *Prerequisites: Elec. Engr.* 135*R*, 135*L*, 120. (3) (Allison)

226–MICROWAVE ENGINEERING. Generation, detection, and measurement of microwave energy; vacuum tubes at ultra high frequencies, the klystron and the magnetron. Lecture, two hours; three hours lab. *Prerequisites: Elec. Engr.* 164*R*, 164*L*, 165. (3) (Allison)

227–ELECTROMAGNETIC FIELDS. Advanced studies in electric and magnetic fields, using vector methods and Maxwell's equations; wave equations, radiation and propagation of energy. *Prerequisites: Elec. Engr.* 165. (3) (Allison)

230a-f–SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING. Open to graduate students who have the ability to carry on research. Individual work in one of the various fields of Electrical Engineering. Laboratory, six hours a week. (3 ea.) (Staff)

231a-d–SEMINAR. Review of current literature in the field of Electrical Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two class hours. (1 ea.) (Staff)

500-1, 2, 3–THESIS. (0) I, II, S (Staff)

MECHANICAL ENGINEERING

100a–MACHINE DESIGN. Design of machine and structural elements. Lecture and recitation, three hours. *Prerequisites: Engr. Draw.* 18 *and Mech. Engr.* 15*b*. *Prerequisite (or to be taken concurrently): Appl. Mech.* 100. (3) I, S (Carter, Gard)

100b–MACHINE DESIGN. Continuation of Mech. Engr. 100a. Drawing room, nine hours. *Prerequisite: Mech. Engr.* 100*a*. (3) I, II, S (Carter, Gard)

104a–ENGINEERING THERMODYNAMICS. Fundamental principles of thermodynamics. Lecture and recitation, three hours. *Prerequisites: Phys.* 3*b*. *and Math.* 20*b*. (3) I, S (Penrod, Thorpe)

104b–ENGINEERING THERMODYNAMICS. Continuation of Mech. Engr. 104a. Lecture and recitation, three hours. *Prerequisite: Mech. Engr.* 104*a*. (3) II, S (Penrod, Thorpe)

105–POWER PLANT ENGINEERING. Study of the characteristics of steam and internal combustion engineering generating power stations. Lecture and recitation, three hours. *Prerequisites: Mech. Engr.* 104*b*, 112. (3) II, S (Walton)

107–FLUID MECHANICS. Fundamental principles of fluid flow. Lecture and recitation, three hours. *Prerequisite: Mech. Engr.* 104*a*. (3) II (Penrod, Baker, Lange)

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, three hours. *Prerequisite: Mech. Engr.* 105*b or* 134. (3) II (Carter, Lange, Marshall)

109–REFRIGERATION. A course which deals with compression and absorption refrigeration machines and installations. Lecture and recitation, three hours. *Prerequisite: Mech. Engr.* 104*b or* 134. (3) I, S (Penrod, Baker)

112–MECHANICAL LABORATORY. Fundamentals of mechanical engineering laboratory practice. Lecture and recitation, one hour; laboratory, three hours. *Prerequisite: Mech. Engr.* 104*a*, *Engl.* 1*b*. (2) II, S (Staff)

113a—MECHANICAL LABORATORY. Performance tests on heating, ventilating, and power plant equipment. Lecture and recitation, one hour; laboratory, three hours. *Prerequisites: Mech. Engr.* 104*b*, 107. (2) I (Staff)

113b—MECHANICAL LABORATORY. Continuation of Mech. Engr. 113a. Lecture and recitation, one hour; laboratory, three hours. *Prerequisite: Mech. Engr.* 113*a*. (2) II (Staff)

114a—AIR CONDITIONING, HEATING, AND VENTILATING. Theory of air conditioning and the mechanical equipment of buildings. Lecture and recitation, three hours. *Prerequisite (or to be taken concurrently): Mech. Engr.* 109. (3) I (Baker, Pfennigwerth)

114b—AIR CONDITIONING, HEATING, AND VENTILATING DESIGN. Continuation of Mech. Engr. 114a and the complete design and layout of a year-round air-conditioning system. Lecture, one hour; drawing room, six hours. *Prerequisite: Mech. Engr.* 114*a*. (3) II (Baker, Pfennigwerth)

116—ELEMENTARY HEATING, VENTILATING, AND AIR CONDITIONING. Fundamental principles of air conditioning. Lecture and recitation, three hours. *Prerequisite: Phys.* 1*a or its equivalent*. (3) II (Baker, Pfennigwerth, Walton)

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 (Staff)

122b—SEMINAR. Continuation of Mech. Engr. 122a. Two hours a week. *Prerequisite: senior classification*. (1) II (Staff)

129—ELEMENTS OF HEAT TRANSFER. Fundamental principles of heat transfer. Lecture and recitation, four hours. *Prerequisite: Mech. Engr.* 104*b*. (4) I, S (Penrod, Baker, Walton)

130—APPLIED AERODYNAMICS. Fundamental principles of fluid mechanics applied to aerodynamics. Lecture and recitation, three hours. *Prerequisites: Mech. Engr.* 104*b*, 107. (3) I (Lange, Gard, Marshall)

131a—AIRPLANE DESIGN. Covering fundamental principles of airplane design. Lecture and recitation, three hours. *Prerequisite (or to be taken concurrently): Mech. Engr.* 130. (3) (Lange, Gard, Marshall)

131b—AIRPLANE DESIGN. Continuation of Mech. Engr. 131a. Lecture and recitation, one hour; drafting room, six hours. *Prerequisite: Mech. Engr.* 131*a*. (3) (Lange, Gard)

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; drawing room, six hours. *Prerequisite: Mech. Engr.* 100*b*. (3) I (Carter, Gard)

134—ELEMENTS OF ENGINEERING THERMODYNAMICS. (For Civil, Electrical and Mining Engineers.) General energy equations, mixtures of gases and vapors, flow of fluids, vapor power cycles, internal combustion cycles, and refrigeration cycles. Recitation, three hours. *Prerequisites: Phys.* 3*b and Math.* 20*b*. (3) I (Staff)

135—EXPERIMENTAL AERODYNAMICS. 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. Engr.* 130. (3) II (Lange, Gard, Marshall)

136—INTERNAL COMBUSTION ENGINE LABORATORY. A study of magnetos, distributors, fuel ignition, timing, carburetors, oil systems, and performance tests on engines. Aeronautical Laboratory, three hours. *Prerequisites (or to be taken concurrently): Mech. Engr.* 108, 113*a*. (1) I, II (Marshall, Walton, Pfennigwerth)

137—MOTION AND TIME STUDY. Principles and uses of motion economy and fundamentals of time study. Lecture and recitation, three hours. *Prerequisite: Mech. Engr.* 15*b*. (3) I (Gard)

138—PRODUCTION ENGINEERING. Scheduling, routing, material control, quality control, and problems in engineering economy. Lecture and recitation, three hours. *Prerequisite: Mech. Engr.* 137. (3) I (Gard)

139—PLANT LAYOUT. Selection of processes and machines, material handling systems, and plant requirements. Lecture, two hours; drawing room, three hours. *Prerequisite: Mech. Engr.* 138. (3) II (Gard)

141a—MECHANICAL AND ELECTRICAL EQUIPMENT FOR BUILDINGS. A course for Architectural Engineers. The principles of water supply, plumbing and drainage, air conditioning, electrical equipment, lighting, and acoustics are studied. Lecture and recitation, three hours. *Prerequisite: Phys.* 3*b*. (3) I (Baker, Pfennigwerth)

141b—MECHANICAL AND ELECTRICAL EQUIPMENT FOR BUILDINGS. Continuation of Mech. Engr. 141a. Lecture and recitation, three hours. *Prerequisite: Mech. Engr.* 141*a*. (3) II (Baker, Pfennigwerth)

202a-d—POWER PLANT ENGINEERING. Advanced work in the design, selection, layout, and operation of heat-power plant equipment. (3 ea.) (Penrod, Walton)

203a—HEATING, VENTILATING, AND AIR CONDITIONING. Theoretical analysis of complex refrigeration cycles and treatment of advanced refrigeration topics; intermittent heating; advanced psychrometics and air conditioning techniques. (3) (Baker)

203b—HEATING, VENTILATING AND AIR CONDITIONING. Analysis of panel heating and cooling systems; theoretical development of exact radiation equations involving multiple reflections; configuration factor analysis; exact and simplified design techniques. (3) (Baker)

203c, d—HEATING, VENTILATING AND AIR CONDITIONING. Advanced work in the design, selection, layout, and operation of heating, ventilating and air conditioning equipment with emphasis on industrial application and heat pump design. (3 ea.) (Baker)

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.) (Gard, Carter)

210a-f—SPECIAL PROBLEMS IN MECHANICAL ENGINEERING. For graduate students having research ability. Each course consists of individual work in one of the various fields of Mechanical Engineering. Laboratory, six hours. *Prerequisite: approval of Head of Department.* (3 ea.) (Staff)

211a—ADVANCED ENGINEERING THERMODYNAMICS. Critical treatment of the laws of thermodynamics, temperature scales; application of theory to compressors and internal combustion engines; frequent reference to research papers. Lecture four hours. *Prerequisite: Mech. Engr. 104b or consent of instructor.* (4) I, II (Penrod)

211b—ADVANCED ENGINEERING THERMODYNAMICS. Continuation of Mech. Engr. 211a. *Prerequisite: Mech. Engr. 211a.* (4) II (Penrod)

212a—ADVANCED FLUID MECHANICS. Fundamentals of hydro- and aero-mechanics treated by the use of vector and tensor calculus. Lecture, four hours. *Prerequisite: Mech. Engr. 107 or consent of instructor.* (4) I (Penrod, Lange)

212b—ADVANCED FLUID MECHANICS. Continuation of Mech. Engr. 212a. *Prerequisite: Mech. Engr. 212a.* (4) II (Penrod, Lange)

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. *Prerequisite: Mech. Engr. 107, 129 or equivalent.* (4) I (Baker, Penrod)

213b—ADVANCED HEAT TRANSFER. Continuation of Mech. Engr. 213a. *Prerequisite: Mech. Engr. 213a.* (4) II (Penrod, Baker)

214a, b—SPECIAL PROBLEMS IN AERONAUTICAL ENGINEERING. Advanced course in aircraft power plant engineering dealing with special problems in reciprocating engines, gas turbines, and jet propulsion. Aeronautical Laboratory, nine hours. *Prerequisite: approval of Head of Department.* (3 ea.) I, II (Marshall, Lange)

215a-d—SEMINAR. Review of current literature in the field of Mechanical Engineering, general discussion and presentation of papers on departmental research. Required of all graduate students. Two hours. (1 ea.) (Penrod, Carter, Baker)

216—STEAM TURBINES. Steam turbine cycles; flow of steam through nozzles and blades; internal losses; reheat factor; regenerative feed heating; turbine performance at varying loads; mixed-pressure turbines; construction of nozzles and diaphragms. *Prerequisite: approval of Head of Department.* (4) (Penrod)

217—GAS TURBINES AND JET PROPULSION. Momentum, energy, and thermodynamics of gas flow; performance calculations; centrifugal, axial-flow, and Lysholm compressors; gas turbine cycles and characteristics; combustion chamber; aircraft, stationary, marine, and locomotive power plants; rockets. *Prerequisite: approval of Head of Department.* (4) (Penrod, Carter)

218—ADVANCED GEAR DESIGN. Fundamentals of gearing; involute trigonometry; design of planetary gear systems and transmission; study of gear forms such as bevel, helical, worm and spiral; study of gear manufacturing methods. Lecture and recitation, three hours. *Prerequisite: Mech. Engr. 100b.* (3) (Carter)

500-1, 2, 3—THESIS. (0) I, II, S (Staff)

METALLURGICAL ENGINEERING

Two graduate degrees in Metallurgical Engineering are awarded: the Master of Science in Metallurgical Engineering and the Doctor of Engineering.

121—FUEL AND METALLURGICAL LABORATORY. Analysis of ores, slags and other metallurgical products by both wet and dry methods; determinative methods utilized in the analysis of fuels. Laboratory, six hours. *Prerequisites: Chem. 21a, and Met. Engr. 27.* (2) I, II (Kendall)

128—METALLURGY OF NON-FERROUS METALS. Principles and processes employed in the production and preparation of copper, lead, aluminum, and other non-ferrous metals; consideration of the strategic and economic importance of these metals. Lecture and recitation, three hours. *Prerequisite: Met. Engr. 27.* (3) I, II (Crouse)

132—METALLURGICAL CALCULATIONS. Calculations involved in the practical application of metallurgical principles both general and specific. Recitation and problems, five hours. *Prerequisites: Chem. 21a; and Met. Engr. 29, 128.* (5) I, II (Crouse)

140—THE SCIENCE OF METALS. First course in physical metallurgy; correlation of structures of metals and alloys to their physical properties together with the effects of mechanical work and heat. Lecture and recitation, three hours. *Prerequisites: Phys.* 3; *Chem.* 21*a; and Met. Engr.* 29. (3) I, II (Crouse)

142—FERROUS METALLOGRAPHY AND HEAT TREATMENT. Correlation of compositions, heat-treatments, microstructures and properties of ferrous metals and alloys. Engineering, tool, heat-resistant and corrosion-resistant ferrous alloys; and cast irons are included. Lecture, two hours; laboratory, three hours. *Prerequisites: Met. Engr.* 60, 140. (3) I (Gerhard)

143a—PHYSICS OF METALS. Radiography and x-ray metallography; structural metallurgical topics; elastic, plastic properties; diffusion; solubility of gases; introduction to electron and band theory of solids. Lecture and recitation, two hours; laboratory, three hours. *Prerequisites: Phys.* 123*b; Chem.* 140*b; and Met. Engr.* 140. (3) I (Hammond)

143b—PHYSICS OF METALS. This is a continuation of Met. Engr. 143a without the laboratory. Lecture and recitation, three hours. *Prerequisite: Met. Engr.* 143*a.* (3) II (Hammond)

144—NON-FERROUS METALLOGRAPHY AND HEAT TREATMENT. Correlation of compositions, heat-treatments, microstructures and properties of non-ferrous metals and alloys. Commercially pure metals; and solid solution, cold-working, age-hardenable, and martensitic-type alloys are considered. Lecture, two hours; laboratory, three hours. *Prerequisites: Met. Engr.* 60, 140. (3) II (Hammond)

164—ELEMENTS OF LOW TEMPERATURE CARBONIZATION. Principles involved in the low temperature treatment of coals and other carbonaceous materials, including hydrogenation. Lecture and recitation, three hours; assigned reference reading. *Prerequisites: Phys.* 123*b; and Chem.* 140*b.* (3) I, II (Crouse)

166—MINERALS BENEFICIATION. Principles and mechanics of beneficiation involved in the preparation of mine products, principles of plant design, and current developments. Lecture and recitation, five hours. *Prerequisites: Chem.* 22; *Phys.* 3*b; and Met. Eng.* 26 *or* 27. (5) II (Spokes)

167—MINERALS BENEFICIATION LABORATORY. Application of the principles studied in Met. Engr. 166. Laboratory, two hours. *Concurrent with Met. Engr.* 166. (1) II (Spokes)

175a, b—SEMINAR. General discussions of metallurgical subjects; preparation and delivery of papers and reports; extemporaneous speaking, and the briefing of technical books and articles in current literature. Two hours. *Prerequisite: six semesters in metallurgical engineering.* (1 ea.) I, II (Staff)

207—ADVANCED PRODUCTION METALLURGY. Principles and practices used in the production of alloys; with special stress upon any particular group of alloys that the student may choose. Reference reading and laboratory work are emphasized. Lecture, two hours; laboratory, eight hours. (3) I, II (Crouse, Gerhard)

209—ADVANCED ORE DRESSING. Ore dressing plant design and original research in concentration problems. Lecture and recitation, two hours; laboratory, eight hours. (6) I, II (Spokes)

210—TECHNOLOGY OF LOW TEMPERATURE CARBONIZATION. Principles and practices employed in low temperature carbonization of carbonaceous materials such as shales, bituminous and cannel coals. Lecture and recitation, two hours; laboratory, eight hours. *Prerequisite: permission of Head of Department.* (6) I, II (Crouse)

213—X-RAY METALLOGRAPHY. Crystallography; ex-ray theory. Laue, rotation, crystal, powder x-ray diffraction methods; special cameras; structure-factor equations; reciprocal lattice; stereographic, gnomonic projections; poles figures; stress-strain analysis, phase diagrams; electron diffraction. Lecture, three hours; laboratory, three hours. *Prerequisites: Phys.* 119. (4) I, II (Hammond)

214—THEORETICAL STRUCTURAL METALLURGY. Interatomic forces of crystal bonding; free electron zone theory; equilibrium and rate of approach thereto; thermal behavior, structure and free energy of alloy phases; equilibrium diagrams; diffusion; order disorder change; nucleation and phase growth. Lecture, three hours. (3) I, II (Hammond)

215—SPECIAL-PURPOSE ALLOY STEELS. Fundamental principles of the more complicated and special alloy steels and their heat treatment. Carbon, mild alloys, N.C.S.A.E, tool and super alloys are included. Alternate alloy steels for application are considered. Lecture, three hours. (3) I, II, S (Crouse, Hammond)

216—THE PHYSICAL CHEMISTRY OF STEEL MAKING. Reactions involved in steel making processes. Slag constitution, slag control, and effects of additions to liquid metal. Influences of melting, refining, and deoxidizing practices on properties of finished steel are emphasized. Lecture, three hours. (3) I, II (Crouse, Gerhard)

217—THE MICROSCOPY OF SLAGS AND REFRACTORIES. Identification of phases in slags. Emphasis is placed on the interpretation of micro-structural features as indicators of high temperature reaction tendencies among silicate and oxide systems. Lecture and recitation, one hour; laboratory, six hours. (3) I, II (Gerhard)

218—DIFFUSION AND HEAT FLOW IN METALS. Fick and Fourier equations applied to diffusion and solid state transformations, and to the heating and cooling of metals in metallurgical processes. Radiation convection, and conduction are considered in principles of furnace design. Lecture, two hours. (2) I, II (Hammond)

220–CRYSTAL PLASTICITY. Fundamentals of plastic deformation in metals. Topics will include crystallography, slip, twinning, strain hardening, recovery, cold working, cold-worked and recrystallization textures. Heyns stresses, creep and similar subject matter. Lecture and recitation, three hours. (3) I, II (Hammond)

221–ADVANCED PHASE DIAGRAMS. Review of thermodynamic fundamentals and application to binary pressure-temperature-composition diagrams. Construction and interpretation of ternary temperature-composition diagrams. Review and discussion of important ternary diagrams. Lecture and recitation, three hours. *Prerequisite: Chem.* 244. (3) I, II (Hammond)

222–CORROSION. Corrosion mechanisms, including the electrochemical theory, fundamentals of oxidation and tarnish, passivity and effects of crystal orientation on corrosion. Corrosion of various engineering materials in various environments and testing. Lecture, two hours; laboratory, three hours. (3) I, II (Gerhard, Hammond)

223–METALS AT HIGH TEMPERATURE. Fundamental considerations involved in high temperature behavior of metals. Test methods and equipment for elevated temperature testing. A review of the commercial alloys for high temperature use and study of current literature. Lecture, two hours. (3) I, II (Hammond, Gerhard)

224–MATERIALS ENGINEERING. Various factors in specification and testing of materials. Materials for lightweight construction, mechanical and electrical applications, and severe service conditions are treated. Material failures, trouble shooting and testing are discussed. Lecture, two hours; laboratory, three hours. (3) I, II, S (Hammond, Gerhard)

240a-f–SPECIAL PROBLEMS, LITERATURE AND LABORATORY. Literature research and planning of research programs; shop problems and technical writing, including a term paper, are required. Laboratory, six hours. Consultation and lecture by appointment. (3 ea.) I, II (Staff)

275a-h–SEMINAR. Review of current literature in the field of metallurgical engineering and presentation of papers thereon. Presentation of talks on departmental research. Group and panel discussions. Required of all graduate students. Two hours. (1 ea.) I, II (Hammond)

500-1, 2, 3–THESIS. (0) I, II, S (Staff)

MINING ENGINEERING

126a–ELEMENTS OF MINE SURVEYING. Surface and underground methods for coal and metal mine surveys. Tunnel surveys and shaft plumbing. Lecture and recitation, one hour; practical work, three hours. *Prerequisite: Civ. Engr.* 12. (2) I (Spokes)

126b–ELEMENTS OF MINING. Fundamental mining operations, prospecting, and mine development. Lecture and recitation, three hours. *Prerequisites: Chem.* 2*b*, *Phys.* 3*a*, *Geol.* 12*a*. *Prerequisite (or to be taken concurrently): Min. Engr.* 126*a*. (3) I (Spokes, Swift)

130–MINE ADMINISTRATION. The engineering aspects of mine administration and management, including safety engineering. Lecture and recitation, three hours. *Prerequisite: Senior classification.* (3) I (Spokes)

131–MINE SURVEYING. Given at summer surveying camp at Camp Robinson, Noble, Breathitt County, Kentucky. Field practice in mine surveying and mapping. *Concurrent: Civ. Engr.* 15, 16*b*. (1) S (Swift, Spokes)

132–MINE RESCUE TRAINING AND FIRST AID. Required of mining engineers. Fundamental principles of mine rescue training and first aid. Given on University campus by Kentucky Department of Mines and Minerals, U. S. Bureau of Mines, or both in collaboration. *Prerequisite: junior or senior classification.* (0) II

133a, b–COAL PREPARATION. Principles and practice of coal preparation and associated operation. Lecture and recitation, three hours. *Prerequisites: Met. Engr.* 166, 167. (3 ea.) a, I; b, II (Spokes)

134–MINING METHODS. Surface and underground mining of metallic ores and similar materials. Economic, engineering, and operating factors. Lecture and recitation, three hours. *Prerequisite: Min. Engr.* 126*b*. (3) I (Crouse, Spokes)

135–COAL MINING. Surface and underground methods, equipment, and economics in the United States and abroad. Lecture and recitation, two hours. *Prerequisite: Min. Engr.* 126*b*. (2) II (Spokes, Swift)

136–MINE VENTILATION. The principles and methods of mine ventilating and air conditioning; the control of dangerous impurities. Lecture and recitation, two hours. *Prerequisite: Min. Engr.* 126*b*. (2) II (Spokes, Swift)

137–MINE PLANT AND MACHINERY. Theory and practice of mine haulage, hoisting, drainage, and pumping; compressed air practice. Lecture and recitation, three hours. *Prerequisite: Min. Engr.* 126*b*. (3) I (Swift)

138–MINE PLANT DESIGN. The application of engineering principles to the problems of mining. Drawing room, four hours. *Prerequisite: Senior classification.* (2) I (Spokes)

139–VALUATION OF MINERAL PROPERTIES. Methods of appraising the value of deposits of ores, mineral fuels, and non-metallics. Lecture and recitation, two hours. *Prerequisites: Econ.* 51, *Min. Engr.* 126*b*. (2) II (Swift)

175a, b—SEMINAR. 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 (Staff)

203—MINE ORGANIZATION. Detailed study of the structure and function of a mining enterprise from both the financial and the engineering standpoint. Lecture and recitation, three hours. (3) I, II (Spokes)

207—ADVANCED PROSPECTING. 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 (Spokes)

209—ADVANCED MINE ENGINEERING. Procedure and methods of collecting and recording data for the systematic development and exploitation of a mining property. Lecture and recitation, three hours; drawing and mapping, eight hours. (7) I, II (Spokes)

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 (Spokes, Swift)

221a-d—SEMINAR. Review of current literature in the field of Mining Engineering and presentation of papers on departmental research. Required of all graduate students. Two hours. (1 ea.) (Staff)

222—CERAMIC ENGINEERING. Materials and equipment used in the ceramics industry. Physical and chemical principles relating to the manufacture of ceramic products such as pottery, tile, brick, whiteware, refractories, glass, and enamels on metals. Calculations involving formulas, batches of materials, and the drying and firing of ceramic ware. Lecture and recitation, three hours. (3) I, II (Swift)

223—FUELS AND THEIR COMBUSTION. Available fuels in the solid, liquid, and gaseous states. Emphasis will be on the utilization of fuels in the mineral industries. Technology of fuels. Physics and chemistry of combustion. Combustion calculations. Lecture and recitation, three hours. (3) I, II (Crouse)

224—PREPARATION AND USES OF INDUSTRIAL MINERALS. Sources, processing, marketing, utilization, and economics of nonmetallic minerals, and product specifications. Clay, limestone, asbestos, refractories, etc., will be studied. Lecture and recitation, three hours. (3) I, II (Swift)

500-1, 2, 3—THESIS. (0) I, II, S (Staff)

VI. LAW

The following courses in the College of Law are accepted as graduate work when taken by students majoring in Political Science, Economics, Sociology, Commerce or other fields in which such courses are recommended by the major professors. No major programs of study are offered in Law at present leading to a degree other than Bachelor of Laws (LL.B.).

101a, b–CONTRACTS I, II. Anderson's Cases. Formation of contracts, offer, acceptance, consideration, Statute of Frauds, parties affected by contracts, contracts for benefit of third persons, assignments, joint and several contracts, performance of contracts, express and implied conditions, impossibility of performance, and illegal contracts. (3) I, II (Ham)

102a, b–TORTS I, II. Seavy, Keeton and Thurston's Cases. Intentional torts and defenses, negligence, causation, duties of occupants of land and manufacturers and vendors of chattels. (3) I, II (McEwen, Oberst)

103–PROPERTY I AND II. Casner and Leach's Case. Basic course in property: possession, gifts, bona fide purchasers of personalty, estates in land before and after, the Statute of Uses, easements, and rights incident to ownership. (4) I (Matthews)

107a–CRIMINAL LAW. Hall and Glueck's Cases. Jurisdiction; the criminal act, complete and incomplete; criminal intent, actual and constructive; duress and mistake of fact, of law; justification; parties in crime; crimes against the person; and crimes against property. (2) I (Moreland)

107b–CRIMINAL PROCEDURE. Hall and Glueck's Cases. Arrest, preliminary examination, bail, methods of prosecution, the grand jury, indictment and information, arraignment and pleas, nolle prosequi and motion to quash, trial and verdict, motions after trial. (2) II (Moreland)

122–PROPERTY III. Casner and Leach's Cases. Titles and conveyancing. Adverse possession; prescription; accretion dedication; mode of conveyance at common law, under the Statute of Uses, and under modern statutes; execution of easements by implication; estates; covenants for title; estoppel by deed, and priorities. (3) II (Matthews)

123–NEGOTIABLE INSTRUMENTS. Britton's Cases on Bills and Notes. (4th edition.) A general study of the law of bills and notes following the Uniform Negotiable Instruments Law, including: operative facts of negotiability; transfer; holders in due course; defenses; liability of primary and secondary parties. (3) I (Stahr, Ham)

145–INSURANCE. Goble's Cases on Insurance. Nature of contract, insurable interest, making the contract, concealment, representations, warranties, implied conditions of forfeiture, waiver and estoppel, rights under the contract, and construction of the policy. (2) II (Ham)

148–DOMESTIC RELATIONS. Compton's Cases. Contracts to marry; requisites and incidents of marriage status; annulment, divorce and separation; parent and child; infants and incompetent persons. (2) I (Whiteside)

150–PUBLIC UTILITIES. Robinson's Cases (2d edition). Nature and scope of public utility concept–historical and modern; methods of determining rate base; reasonable rates; duty to serve–extent and limitations. (3) S (Moreland)

154–DAMAGES. McCormick's Cases. Nature of damages, avoidable consequences, counsel fees, certainty, compensation, damages for non-pecuniary injuries, interest, damages for death, and eminent domain. (2) S (Oberst, McEwen)

161–CONSTITUTIONAL LAW. Dowling's Cases (4th edition). Judicial review, relationships in the federal system, powers of Congress, powers of the President, powers of the states. Due process, procedural and substantive; obligation of contracts, equal protection, civil rights, privileges and immunities. (4) I (Oberst)

162–PROPERTY IV (Future Interests). Simes' Cases (2nd edition). Types of future interests; construction problems; limitations to classes; rule against perpetuities, illegal restraints and conditions. (3) II (Matthews)

163–WILLS AND THE ADMINISTRATION OF ESTATES. Mechem and Atkinson's Cases (4th edition). Descent and distribution, the making and revocation of wills. (2) II (Whiteside)

164–CONFLICT OF LAWS. Cheatham, Dowling and Goodrich's cases (3rd edition). Nature of the subject, penal laws, procedure, judgments, domicile, capacity, form, particular subjects, litigation, family law, inheritance, foreign administrators. (3) II (McEwen, Moreland)

165–TRUSTS. Scott's Cases (4th edition). Uses and Statute of Uses; trusts as to creation; elements; transfer of beneficiary's interest; administration, termination and modification; charitable trusts; resulting and constructive trusts; powers. (3) I (Matthews)

166–SALES. Vold's Cases (2nd edition). Time of transfer of title; future goods, fungible goods, seller's lien, stoppage in transitu, conditional sales, documents of title, trust receipts; remedies of seller, buyer; express, implied warranties. (3) I (Ham)

167—ADMINISTRATIVE LAW. Gellhorn and Byse's Cases. Establishment of administrative tribunals, limits on discretion. Notice and hearing, orders, methods of judicial relief, scope of judicial review. (3) II (Oberst)

176—TRADE REGULATION. Oppenheim's Cases. Unfair competition in promoting sales, obstruction of access to markets, price practices and price policies, combination and monopoly, anti-trust laws. (3) S (Oberst)

178—CREDILTORS' RIGHTS. Hanna and McLachlan's Cases (4th edition). Enforcement of judgments; fraudulent conveyances; general assignments; creditors' agreements; receiverships; bankruptcy, assets, and distribution. (3) I (Whiteside)

179—LEGISLATION. Nutting and Elliott's Cases. The history of legislation, legislative power: scope and functions; legislative organization and procedure, types of statutes, parts of a statute, methods of interpretation, and relation of traditional law to legislation. (3) II (Ham, Matthews)

180—LABOR LAW. Smith's Cases and Materials (2nd edition). History, organization and structure of American labor unions, obligations of employers; questions of representation; privileges and obligations of unions; collective bargaining and dispute settlement. (2) II (Stahr)

183—LANDLORD AND TENANT. Walsh and Niles's Cases. Characteristics of lease; the 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 (Staff)

186—LOCAL GOVERNMENT LAW. Fordham's Local Government Law. Legislative control over municipal corporations; municipal powers in general; licenses and franchises; appropriation of municipal funds; municipal contracts, indebtedness, torts, property, special assessments. (2) II (Stahr)

187—CORPORATIONS. Dodd and Baker's Cases (2nd edition). Characteristic features of a private corporation, the entity concept and its disregard; method of formation; defectively formed corporations; structure of management; problems of control; scope of corporate activities; powers, duties and responsibilities of directors; stockholders' derivative suits. (3) I (Ham)

188—CORPORATION FINANCE LAW. Dodd and Baker's Cases (2nd edition). Study of the corporate capital structure, promotion, payment for shares and valuation of property exchanged, dividends, treasury stock, organic changes, reduction of capital. (2) II (Ham)

189—INCOME TAXATION. Griswold's Cases on Federal Taxation (3rd edition). Problems in federal and state income taxation. (3) II (Whiteside)

190—ESTATE, INHERITANCE AND GIFT TAXATION. Problems in state and federal estate, inheritance and gift taxation, with some attention to estate planning. (2) S (Whiteside)

191a, b—EQUITY I, II. Chafee, Simpson and Maloney's Cases (3rd edition). The traditional equity materials. (4) I, (2) II (Moreland)

193—SURETYSHIP. Durfee's Cases on Security. Pledges, suretyship rights, suretyship defenses, Statute of Frauds. (2) II (Oberst)

194—MORTGAGES. Durfee's Cases on Security. Creation, assignment, priority, foreclosure, redemption. (2) I (Matthews)

195—INTERNATIONAL LEGISLATION (SEMINAR). A course for second and third year law students on the development and codification of international law. History of codification; promotion of codification under League of Nations and United Nations; international law and war criminal trials; genocide pact; Universal Declaration and Covenant of Human Rights and other similar topics. (2) II (Staff)

196—AGENCY AND PARTNERSHIP. Steffen's Cases on Agency (2nd edition). Study of traditional agency materials; nature of partnership; characteristics of partnership property; dissolution; distinction between partnership and other forms of unincorporated business associations. (3) II (Ham)

VII. PHARMACY

Major programs leading to advanced degrees are not at present offered in the College of Pharmacy.

101a—ADVANCED ORGANIC PHARMACEUTICAL CHEMISTRY. A study of the classification, source, properties, synthesis and uses of organic medicinal chemicals used as therapeutic agents. Lecture, one hour; laboratory, six hours. *Prerequisites: Phar. Chem.* 31*a, b.* (3) I (Gillis)

101b—ADVANCED ORGANIC PHARMACEUTICAL CHEMISTRY. A continuation of 101a. Lecture, one hour; laboratory, six hours. *Prerequisites: Phar. Chem.* 31*a, b.* (3) II (Gillis)

102—BIOCHEMISTRY. Chemistry of carbohydrates, lipids, proteins, enzymes, and vitamins in relation to physiological processes. Special reference is made to compounds used in pharmacy. Included is practice in the use of the polarimeter, refractometer, colorimeter, Westphal balance, etc. Lecture, two hours; laboratory, six hours. *Prerequisites: Phar. Chem.* 31*a, b.* (4) I (Gillis)

103a—ADVANCED QUANTITATIVE PHARMACEUTICAL CHEMISTRY. Chemistry and assay of medicinal products, including newer synthetics, fixed oils, volatile oils, alkaloids, vitamins and enzymes. Laboratory exercises selected on basis of application to pharmaceutical products. Lecture, one hour; laboratory, six hours. (3) I (Gillis)

103b—ADVANCED QUANTITATIVE PHARMACEUTICAL CHEMISTRY. A continuation of 103a. Lecture, one hour; laboratory, six hours. *Prerequisite: Phar. Chem.* 103*a.* (3) II (Gillis)

111a—DISPENSING PHARMACY. The application of fundamental pharmaceutical principles and techniques to the compounding of the various types of preparations encountered on prescriptions. Practical methods for insuring qualitative and quantitative accuracy are stressed. Lecture, two hours; laboratory, six hours. *Prerequisite: Pharmacy* 27. (4) I (Slesser)

111b—DISPENSING PHARMACY. Methods of detecting and handling common types of prescription incompatibilities. Film studies of projected handwritten prescriptions selected from current drug store files. Methods of prescription pricing. Lecture, two hours; laboratory, six hours. *Prerequisite: Pharmacy* 111*a.* (4) II (Slesser)

122—U.S.P. & N.F. DRUGS. A study of the official drugs with special attention to chemical drugs. Emphasis is given to synonyms, proprietaries of like composition, uses, dosage and common compounding incompatibilities. Lecture, three hours. *Prerequisite: Pharmacy* 24*b.* (3) I (Lesshafft)

123—MODERN DRUGS. A comprehensive comparative study of the newer drugs used in pharmacy. The uses, chemistry and proprietary forms of administration are considered. Lecture, three hours. *Prerequisite: Pharmacy* 122. (3) II (Lesshafft)

130—MANUFACTURING PHARMACY. Methods of larger scale manufacture of compressed tablets, solutions, mixtures, ointments and creams, and suppositories. The use and care of equipment involved. Field trips to medium-sized pharmaceutical manufacturing concerns. Lecture, two hours; lab, three hours. Admission: By special permission of department head. (3) I, II (Rehberg)

138a—PHARMACOLOGY AND TOXICOLOGY. A presentation of the pharmacodynamic actions, modes of administration, toxic manifestations of drugs, and relationship of pharmacodynamic action to therapeutic use. Lecture, four hours; laboratory, two hours. (5) I (Walton)

138b—PHARMACOLOGY AND TOXICOLOGY. A continuation of 138a. Presenting to the student emergency treatment in cases of acute poisoning and mechanical injury. Standard First Aid Methods are demonstrated. Acute and chronic poisoning by noxious agents and application of remedial measures are discussed. Lecture, four hours; laboratory, two hours. (5) II (Walton)

FELLOWS AND SCHOLARS FOR 1954-55

John Socrates Anthracopoulos	Rural Sociology	Athens, Greece
John Shih-yao Chiu	Economics	Shanghai, China
William Thomas Clark	Geography	Vanceburg
Edward McKenzie Coffman	History	Hopkinsville
Thomas Blythe Gentry	English	Danville
Judith Griffin	History	Bowling Green
Jack Gruber	Bacteriology	Brooklyn, N. Y.
Sidney Halperen	Bacteriology	Brooklyn, N. Y.
James Lee Heizer	History	Louisville
John Raymond Killinger, Jr.	English	Somerset
Sarah Lorine Kinlaw	English	Wilmore
James Walter Loyd	Education	Lebanon, Tenn.
Frederick Thomas Moffatt, Jr.	History	Frankfort
David Winfred Neil	Physics	Athens, Tenn.
Donato Bernardez Pableo	Education	Philippines
Dorothy Ann Reed	Music	Sedalia, Mo.
George Herbert Sanderson	Philosophy	Lexington
William Jacob Sowder	English	Roanoke, Va.
Richard Laverne Troutman	History	East Aurora, N.
Mary Conrard Voorhes	Library Science	Lexington

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