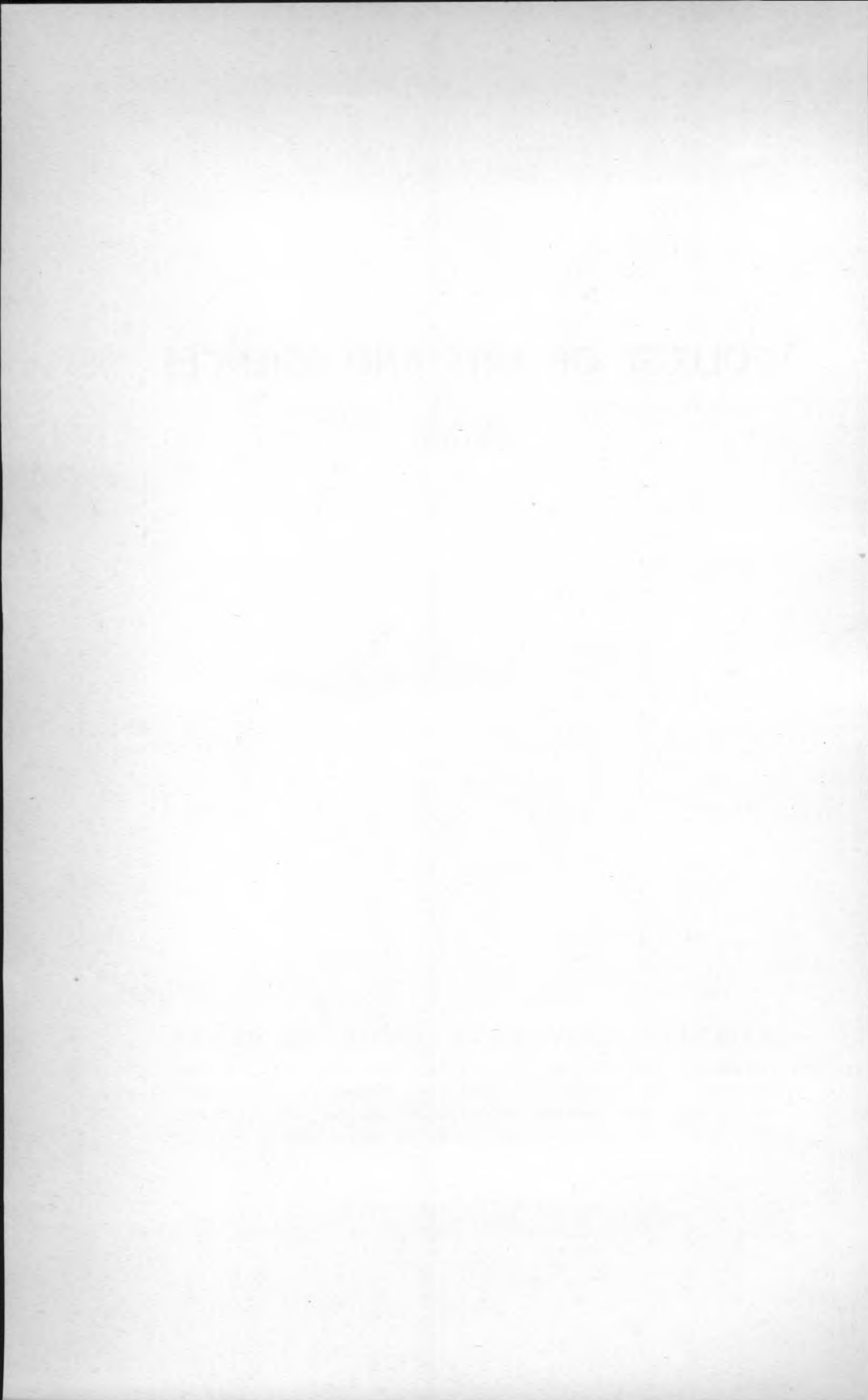


# COLLEGE OF ARTS AND SCIENCES

1956-1957

## CORNELL UNIVERSITY ANNOUNCEMENTS

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<sup>11</sup>Leave of absence, spring term, 1956-1957.

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<sup>12</sup>Leave of absence, 1956-1957.

<sup>17</sup>Leave of absence, spring term, 1956-1957.

<sup>18</sup>Leave of absence, 1956-1957.

<sup>19</sup>Leave of absence, spring term, 1956-1957.

<sup>20</sup>Leave of absence, spring term, 1956-1957.



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## COLLEGE OF ARTS AND SCIENCES

THE COLLEGE of Arts and Sciences is liberal and nontechnical in purpose. The definition of a liberal college is found in the subjects which make up its curriculum; namely, those subjects which, in the history of human civilization, have distinguished themselves as the means whereby man has come to understand himself and the world in which he lives. As thus conceived, a liberal education is a special knowledge of some general field of human understanding, erected upon a fundamental training in the humanities, natural sciences, and social studies.

The College of Arts and Sciences offers instruction in classical and modern languages and literatures, philosophy, and music and the fine arts; in history, the social studies, and psychology; and in mathematics and the natural sciences. The Faculty requires: (1) that each student before graduation shall pursue a course, or courses, designed to make him competent in the use of the English language; (2) that he shall demonstrate or achieve a working knowledge of a foreign language; and (3) that he shall attain a basic knowledge of certain areas of the humanities, history, the social studies, and the natural sciences. Before the end of the second year the student must have selected a major field of study for the remainder of his work. This requirement is broadly conceived to include a sequential and a related group of courses, by means of which he may secure a degree of mastery of a specialized field of knowledge. The remainder of his course of study is largely elective under the supervision of a Faculty adviser whom he chooses and who will assist him in making a reasonable and appropriate selection of courses. Many of the subject offerings of the other colleges of the University are available to him, either as electives or as related subjects for the fulfillment of his major requirements.

The facilities of the College are adequate in staff and equipment to give personal attention to the varying needs of individual students, including requirements of a prevocational and preprofessional nature. Advanced courses and opportunities for research are available in the undergraduate years to those who are qualified to make use of them; and in addition to his regular courses, a student may work informally under the supervision of his major adviser (p. 20). Thus he may complete his education in a manner more flexible than would otherwise be possible. A student is expected to accept a large amount of responsibility for shaping his own course of study, but his adviser stands

ready to assist him in all possible ways to make the most of the opportunities offered by the College.

## REQUIREMENTS FOR ADMISSION

An applicant for admission to the freshman class in the College of Arts and Sciences must have completed a secondary school course giving satisfactory preparation for the work of the College. Sixteen units of entrance credit are required, representing at least four years' work in a preparatory or high school. Four years of English, and elementary and intermediate algebra must be included in these entrance requirements. The remaining units should normally be made up of foreign language (ancient or modern), science, and social studies (including history). Each candidate for admission is required to take the Scholastic Aptitude Test of the College Entrance Examination Board in January and to request the Board to report the result to the Director of Admissions, Cornell University.

All accepted applicants must take the English Achievement Test of the College Board not later than May for placement in class sections. Those who have studied a modern foreign language for two years in secondary school must take the achievement test of the College Board in the language not later than May.

An applicant for admission who has completed a year or more of work in another institution of recognized collegiate rank will not be required to have a total of sixteen units of entrance credit as prescribed for freshmen. However, the specific requirements in English and algebra must be met either in secondary school or college unless waived in an individual case. The total preparation of each candidate will be considered also, and, if there appears to be a marked deficiency in preparation, advanced standing credit may be reduced proportionately.

An applicant for admission to the sophomore or junior class is required to take the Scholastic Aptitude Test of the College Entrance Examination Board, preferably not later than March. Action will be taken on completed credentials about May 1.

The health requirements of the University are described on page 25. This section should be read carefully, as many of the requirements may be met prior to entrance.

Not all applicants can be admitted. Those that seem best qualified are selected after a comparative study not only of the formal preparation, but also of evidences relating to each applicant's character, seriousness of purpose, and fitness to undertake the work of the College.

Applicants for admission should also consult the *General Information Announcement* issued by the University. This publication contains more detailed information on entrance requirements, with notes on expenses, including tuition charges and fees, scholarships, loan funds,

and matters of general interest to students. The *General Information Announcement* and all other catalogues of Cornell University may be obtained by writing to Cornell University Announcements, Edmund Ezra Day Hall, Ithaca. Application forms are to be had from the Director of Admissions, Edmund Ezra Day Hall, and communications concerning admission should be addressed to him.

## ADVANCED STANDING CREDIT

A student admitted to the College of Arts and Sciences from another college of Cornell University, or from any other institution of collegiate rank, will receive credit toward the degree of Bachelor of Arts for the number of hours to which his records may, in the judgment of the Faculty, entitle him, provided that the total number does not exceed sixty hours. No more than fifteen hours may be in courses not commonly given by the College of Arts and Sciences. In order, however, to obtain the degree of Bachelor of Arts, a student must, as a candidate for that degree, have been in residence at least two years in the College of Arts and Sciences, and in that college only.

Freshmen may receive advanced placement in English and foreign language or exempt the requirements by demonstrating competence of a high order on the appropriate achievement test or advanced standing examination of the College Entrance Examination Board. Advanced placement and credit toward the degree of Bachelor of Arts may be earned in some subjects other than English and foreign language by attaining high marks on course examinations at entrance and at the end of the first term of residence, or on the advanced standing examinations of the College Entrance Examination Board. In individual cases, adjustment of the requirements of the Common Studies Program will be made by the Committee on Academic Records.

## REGISTRATION IN COURSES

During a period before the opening of each term, every student will, with the aid of an adviser, prepare a program of studies. For the academic year of 1956-1957, registration for the fall term will be held in the period May 1 to May 10, 1956, and registration for the spring term will be held in the period November 12 to November 21, 1956.

Program changes will be permitted, without petition or fee, upon recommendation of the adviser, prior to August 15 for the fall term and prior to January 1 for the spring term, and again during the first ten days of instruction upon the payment of a \$3 fee. After the first ten days of instruction, a course may be canceled prior to the date for reporting midterm grades, when such cancellation is in the best interest of the student, and after a petition has been approved by the Dean. A \$3 fee

may be charged. After that date, a course may be canceled for medical reasons only.

Students failing to register for courses during the announced periods may be subject to a \$2 fine unless a more extreme penalty is invoked.

Freshmen will have the opportunity to register by mail in the summer and may expect a communication on the subject early in July from the Chairman of the Advisory Board for Underclassmen.

## ADVISERS

During the summer each entering freshman and re-entering underclassman will be assigned to a member of the Advisory Board for Underclassmen, which has jurisdiction over freshmen and sophomores until they have selected major advisers. The function of the underclass adviser is to assist the student in his choice of studies, to advise him during the term regarding his work, and to give him friendly counsel.

## SPECIAL PROGRAMS

The facilities of this college are intended primarily for students interested in a liberal arts education but are also available, by means of the following special programs, to students planning eventually to enter certain of the professions.

**PREPARATION FOR TEACHING.** . . Students planning to teach in the secondary school may combine professional preparation with other prescriptions of the College in satisfaction of the requirements for graduation. A fifth year of preparation is required for the permanent certificate in New York State.

Programs for such students have been arranged in English and public speaking, in foreign languages, in social studies, and in science and mathematics. Advice should be sought early regarding teaching opportunities in these subjects, combination of subjects usually required of teachers, choice of the major subject, and related matters.

Questions may be directed to Professor L. G. Hixon, School of Education, Rand Hall, and to members of the advisory committee representing the various fields of concentration. New students interested in teaching are requested to confer with Professor Hixon in their first term of residence. (See also the *Announcement of the School of Education*.)

**PREMEDICAL STUDENTS.** . . All premedical students are requested to report once each semester to Professor L. L. Barnes, Rockefeller 155, who is the chairman of the Premedical Advisory Board.

Certain minimum admissions requirements are prescribed by all medical schools. Since the most substantial of these requirements is in the field of chemistry, it is recommended that the freshman premedical stu-

dent include chemistry in his course of study. Some freshman premedical students choose to take two sciences: either chemistry and zoology or chemistry and physics. Students who plan to make zoology their major subject will find it advantageous to include zoology in their freshman programs.

Medical educators are quite generally agreed that when a premedical student is planning his college course, he should not allow his interest in science to exclude studies in the humanities. They are also agreed that it would be unfortunate for the future of medicine if all premedical students were to take the same premedical course or major in the same subjects.

The Premedical Advisory Board suggests the following first-semester program: English 111 (three hours), French or German (six hours), or Latin (three hours); chemistry (three hours). The remaining three to six hours should be chosen from the courses listed under "Courses Open to Freshmen" (p. 17).

*PRELEGAL STUDENTS.* . . Students planning to take a six-year combined Arts-Law course should confer with the Secretary of the Law School not later than their sophomore year.

*PREPARATION FOR NURSING.* . . Students interested in nursing as a career will be assigned to Professor F. G. Marcham as adviser. A representative of the School of Nursing will come to the campus early in the first term for conferences with prospective applicants.

## NUMBER OF HOURS

An "hour" ordinarily represents attendance once a week at a lecture or recitation, or at a laboratory exercise lasting two hours and a half or three hours.

A freshman will usually register in his first term for fifteen hours of work, in addition to the required hours in physical education and military science (p. 24).

Every student must register in each term for at least twelve academic hours (including naval science but excluding basic military science and physical education). Underclassmen may register for no more than seventeen academic hours, in any case for no more than five courses, except by permission of the Dean. Freshmen and sophomores, however, may carry a total of eighteen hours when the total includes an advanced course in military science. No upperclassman may register for more than eighteen hours in any term except by permission of the Dean. In addition to the required work in physical education and military science, a student on probation may not register for more than sixteen hours and five courses a term, except that an upperclassman may register for eighteen hours upon recommendation of his adviser.



## COURSES OPEN TO FRESHMEN

*See also "Program of Common Studies," below.*

The following are the courses in the College of Arts and Sciences regularly open to freshmen, except that (1) a student may not register for any course for which he has not satisfied the prerequisites, if any are specified (see announcement under each course); (2) a student may not register for any course for which he has presented an acceptable equivalent at entrance. In the section, "Courses of Instruction," the courses open to freshmen are identified by asterisks.

Astronomy 101, 102, 125, 127, 128	Latin 105-106, 107-108, 109, 111, 112
Biology 1	Mathematics 121-122, 133, 161-162, 181, 182, 192
Botany 1 (either term)	Music 101-102, 103-104, 105-106, 107-108, 110, 112, 201-202, 401-402, 403-404, 405-406, 407-408, 409-410, 411-412
Chemistry 101-102, 105-106, 111-112, 115-116, 201	Philosophy 101, 102, 103
Chinese 101, 102, 103, 201, 203	Physics 103, 104, 107, 108
Economics 103-104	Physiology 303
English 111-112, 221-222	Portuguese 111
Fine Arts 101-102, 104, 111-112	Psychology 101, 102, 106, 107, 112
French 101, 102, 103, 201, 203, 301-302, 305-306	Russian 101, 102, 103, 201, 203
Geology 101-102, 105, 108, 111, 115	Sociology 101, 102, 103, 104
German 101, 102, 103, 105, 201-202, 203-204, 301-302, 303, 305-306	Spanish 101, 102, 103, 201, 203, 301-302, 303-304
Government 101, 104	Speech and Drama, 105-106, 131, 133
Greek 101, 103, 201, 203	Thai 101, 102
Hindi 101, 102	Vietnamese 101, 102
History 101-102, 103-104, 107-108	Zoology 101-102
Indonesian 101, 102	
Italian 101, 102, 103, 201, 203, 307-308	

## PROGRAM OF COMMON STUDIES

The Program of Common Studies includes both specific and general requirements and is designed to ensure a basic competence in language and to introduce the student to the major areas of human knowledge.

Before graduation a student must satisfy each of the following requirements:

## A. LANGUAGE

1. ENGLISH, by completing 111-112. The course must be begun in the first year of residence. Students demonstrating in class work and by

examination a high level of accomplishment in English 111 may be exempted from English 112. Foreign students may satisfy the requirement by passing English 211 offered by the Division of Modern Languages.

2. FOREIGN LANGUAGE. The requirement may be met in either an ancient or a modern foreign language.

In the ancient languages (Latin, Greek), the requirement may be met by completing Latin 108 or 112, or Greek 203.

In the modern languages the requirement may be met, except for students declared qualified at entrance, by passing a qualifying examination in one of the following languages: Chinese, French, German, Hindi, Indonesian, Italian, Spanish, and Russian. If a student is declared qualified at entrance, he may satisfy the requirement by passing six hours of more advanced courses (except courses in translation) in the language in which he is qualified, or by six hours in another ancient or modern foreign language. In certain instances a student may satisfy both the language and literature requirement with the same courses.

Students wishing to continue a modern foreign language begun in secondary school will be placed in Course 101 or Course 102, or declared qualified on the basis of their scores on the College Board Achievement Test, or a placement examination given by the Division of Modern Languages on October 31 or April 4 of the 1956-1957 academic year. For students in course, the qualifying examination is given at the end of each term as the final examination in Course 102. Students failing the qualifying examination will receive no credit for Course 102 until they have passed the examination or have passed Course 103.

Students wishing to study a language for which they have had less than two years of preparation may register in Course 101 in that language without examination.

A student who enters from a foreign country and whose mother tongue is not English will satisfy the foreign language requirement by demonstrating competence in English, which shall be defined for the purpose as a modern foreign language.

**B. GROUP REQUIREMENTS.** . . . Each student is required to earn twenty-four hours by passing at least one six-hour course in each of the following groups:

1. THE HUMANITIES:

Chinese 351-352

English 221 and 222, or 251-252

French 201-301, 201-302, 301-302, or 305-306

German 201-202, 301-302, or 305-306



Greek 201-203  
 Italian 201-308, 307-308  
 Latin 112-205, or 205-206  
 Literature 101-102, 201-202, or 321-322  
 Spanish 201-301, 201-302, 301-302, or 303-304  
 Speech and Drama 105-106  
 Fine Arts 101-102 or 111-112  
 Music 101-102 or 101-110  
 Philosophy 101-102

2. NATURAL SCIENCE:

Astronomy 101-102  
 Biology 1  
 Botany 1  
 Chemistry 101-102 (or the equivalent)  
 Geology 101-102  
 Physics 103-104 (or the equivalent)  
 Zoology 101-102

3. SOCIAL STUDIES:

Economics 103-104  
 Government 101-104  
 Psychology 101 and one of the following: 102, 107, or 112  
 Sociology and Anthropology 101-102, 103-104, or 103 and 101

4. HISTORY:

History 101-102, 103-104, 107-108, or 151-152

C. *SECOND COURSE REQUIREMENT*... Each student is required to earn an additional six hours in one of the first three groups below or in Mathematics:

1. THE HUMANITIES
2. NATURAL SCIENCE
3. SOCIAL SCIENCE

or

4. MATHEMATICS (Mathematics 121-122 or the equivalent)

If the student does not choose Mathematics, the requirement may be satisfied by completing six hours of advanced courses in the subject selected under B from Groups 1-3; or by completing a second introductory course from Group 1-3, provided that it deals with a subject other than the one in the group selected under B. The second course must be outside the student's major subject.

## MAJOR SUBJECTS

1. *SELECTION OF MAJOR SUBJECT AND ADVISER.* Before the end of the second year of residence, a student *must* select his major subject from

options listed below. He must at the same time choose as his major adviser a designated representative of the program selected. During the remainder of his residence, he will consult with his major adviser in arranging his course and must obtain his signature on the study card before it is filed in the Dean's office.

American Studies	French Literature	Philosophy
Astronomy	Geology	Physics
Botany	German Linguistics	Psychology
Chemistry	German Literature	Russian Linguistics
Classics	German Studies	Sociology and Anthropology
Classical Civilization	Government	Spanish Linguistics
Economics	History	Spanish Literature
English	Italian Literature	Speech and Drama
Far Eastern Studies	Literature	Zoology
Fine Arts	Mathematics	
French Linguistics	Music	

2. MAJOR REQUIREMENTS. Before graduation, a student must complete courses which satisfy the requirement in his major subject. A statement of this requirement, indicating courses and total hours required, appears before the list of courses in each of the subject divisions. The student must also meet the stated requirement of courses in related subjects. No student may count toward the one hundred and twenty hours required for graduation more than forty-eight hours in courses offered by a single department, with the following exceptions: Freshman English, the first six hours of intensive courses in modern languages, and the first twelve hours of courses for beginners in Latin and Greek. If a comprehensive examination is included in the requirements of the major subject, this must be passed before graduation.

Upon recommendation of the major adviser, the Dean may excuse a student registered simultaneously in this college and in another college of the University from not more than eighteen hours of his major requirements.

3. INFORMAL STUDY. The major requirements in certain subjects may be satisfied in part by informal study. In those subjects in which informal study is arranged, a statement to this effect appears before the list of courses. Departments may require informal study of some or all of their major students or may admit them upon application.

Informal study will consist of reading, reports, experimentation, senior theses, or other work intended to require from the student the expression of initiative in his major subject. This work will be supervised by the major adviser or by a member of the instructing staff approved by him and may be tested by examination at the option of the department.

A student who has sixty credit hours is eligible for informal study. He may earn credit by this means to the amount of six hours in the junior year and of twelve in the senior year.

### CREDIT FOR SUMMER SESSION

Credit for work done in summer sessions at Cornell and elsewhere may be granted to the extent of eighteen hours. A student in good standing may earn a maximum of twelve hours in any single summer prior to his senior year. A student on probation may earn a maximum of six hours in any single session. No credit may be earned in a summer session of less than four weeks except by special permission; and no credit will be allowed for a course passed at less than a grade of 70, or C, or the equivalent.

Any student who undertakes summer session work without prior approval of his adviser, the department concerned, and the Dean does so without any assurance that he will receive academic credit.

### DOUBLE REGISTRATION

A student who has completed at least ninety hours in courses given in the College of Arts and Sciences, including the program of common studies, the University requirements in military training and physical education, and the major, may, with the permission of the faculties concerned, be registered both in the College of Arts and Sciences and in the Cornell Law School, or the Cornell Medical College, or the New York State Veterinary College. (See "Major Subjects," 2, p. 19.) It should be noted, however, that admission to the Medical College is closely restricted and that in recent years the Medical College was able to grant this privilege of double registration to only a very small proportion of the fourth-year students of the College of Arts and Sciences who applied and who were formally eligible for it.

Consult also the italicized statements by the several departments under "Courses of Instruction" (pp. 32 ff.).

### MARKS AND SCHOLASTIC DISCIPLINE

The passing grade is 60. No credit toward graduation will be given for a course in which a mark of less than 60 is recorded, unless the course be repeated and a passing mark received. A student who has received a mark between 50 and 59, inclusive, in any course that is a prerequisite of any other course may, at the discretion of the department concerned, be regarded as having satisfied the prerequisite.

The mark of *inc* will be used to indicate that a course has been left incomplete with respect to specific assignments which may include the

final examination. The mark of *inc* will be assigned only in case of illness or prolonged absence beyond the control of the student, and only when the student has a substantial equity in a course. A student will have a substantial equity in a course when the remaining work can be completed without further registration in the course and when he has a passing grade for the completed portion. A mark of *inc* may be removed, with the consent of the Dean, and upon payment of the fee required by the University, by examination or otherwise as the department may direct. An incomplete that is not removed within one term will revert to a failing grade of fifty, unless an extension of time is granted by the Committee on Academic Records.

A student who in any term does not pass twelve hours (excluding courses in basic military science and physical education), with a grade of 70 or better in at least nine of the twelve hours, will be either dropped from the College or placed upon probation. Furthermore, a student's general record may be so unsatisfactory that the Faculty will refuse him permission to continue in the College even though he has passed twelve hours in the preceding term.

A student failing in the last term, or summer session, of his senior year to meet the requirements in hours and grades described above, will ordinarily be expected to return for another summer session wherein he will be required to make a satisfactory record before he will be graduated.

## LEAVES OF ABSENCE

For reasons satisfactory to the Faculty, a student may be given a leave of absence for a definite or indefinite length of time. If, because of financial, family, or health reasons, a student is required to absent himself for a period of time, but with the expectation of returning, he should apply for a leave of absence. Leaves of absence for medical reasons are issued only upon the recommendation of the University Clinic. Students withdrawing permanently should request an honorable dismissal.

No credit toward graduation may be earned while on leave of absence except in a limited amount by members of the Armed Services.

## REQUIREMENTS FOR GRADUATION

The College of Arts and Sciences offers one degree only, the Bachelor of Arts. This degree will not be conferred upon any student who has not been in residence in Cornell during the last two terms preceding graduation and registered in the College of Arts and Sciences, nor upon any student who has not been in residence during at least two years as a degree candidate in the College of Arts and Sciences and in this college only.

## BACHELOR OF ARTS

A candidate must meet the following requirements for the degree of Bachelor of Arts:

1. Credit for one hundred and twenty hours, of which at least ninety hours must be for courses given in the College of Arts and Sciences. Elementary courses in military training and physical education, which are offered under the jurisdiction of the University, but not of any College, *may not* be counted as part of the thirty hours which a student may elect outside the College of Arts and Sciences, nor as part of the ninety hours required in the College. However, advanced courses in military science and tactics and air science *may* be counted in the thirty hours allowed outside this College, to a maximum of twelve hours. (See also the *Announcement of the Independent Divisions and Departments*.)

2. A grade of 70 or better in at least seventy-two of the required one hundred and twenty hours.

At least three-fifths of the hours in the major subjects must be passed with a grade of 70 or better.

3. Election of courses in accordance with the "Program of Common Studies," p. 17.

4. Completion of the work in military training and physical education as prescribed by the University Faculty (see below).

## BACHELOR OF ARTS WITH DISTINCTION

The degree of Bachelor of Arts with Distinction in all subjects will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, (1) have received the grade of 80 or better in at least ninety hours of courses, and of 90 or better in at least sixty of these; (2) have not received a grade below 70 in more than one course; (3) have received no marks lower than 60. To qualify for the degree of Bachelor of Arts with Distinction in all subjects, a candidate must have completed at least sixty hours at Cornell in courses taught in the College of Arts and Sciences; and if he has received credit toward his degree for work done in another institution, the requirement of grades shall be prorated for the residue of work which must be completed in Arts and Sciences at Cornell.

## BACHELOR OF ARTS WITH HONORS

This degree will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, have satisfactorily completed the Honors program in their major subject and have been recommended for the degree by the department representing their major subject.

Honors programs are designed to free the exceptionally promising student for a substantial portion of his time from the ordinary requirements of academic courses in order that he may be able to broaden and deepen his understanding of the field of his special interest, to explore branches of his subject not represented in the regular curriculum, and to gain experience in original investigation. A candidate for the degree of Bachelor of Arts with Honors is usually required to pass a comprehensive examination in his major subject or to submit a thesis or some other satisfactory evidence of capacity for independent work. When performance has been outstanding, the degree of Bachelor of Arts with High Honors will be conferred. When performance does not justify a degree with Honors, the student may receive course credit toward the degree of Bachelor of Arts.

To be eligible for admission to an Honors program, a student must have upperclass standing and a cumulative average grade of at least 80. A student who, after admission to Honors work, fails to maintain this average or for any other reason is found by his department to be unsuited to Honors work, will revert to candidacy for the regular Bachelor of Arts degree.

#### UNIVERSITY REQUIREMENTS IN MILITARY TRAINING AND PHYSICAL EDUCATION

*MILITARY TRAINING.*...All physically qualified undergraduate men who are American citizens must take military training during their first four terms. Enrollment in and completion of the basic course in military science and tactics, or air science, or the first two years of naval science, satisfies this requirement. Students transferring to Cornell from other institutions are exempt from part or all of the requirement, according to the number of terms of residence in college before transfer; and service in the armed forces also satisfies the military training obligation. Entering students who have had ROTC training in secondary or military schools are requested to bring DD Form 68 (Student's Record—ROTC) for presentation to the appropriate military department at the time of registration. (See also the *Announcement of the Independent Divisions and Departments.*)

Credit in advanced courses in the Army or Air ROTC programs to the extent of twelve hours may be counted in the thirty hours allowed outside the College.

In the Naval ROTC program eighteen hours may be counted toward the one hundred and twenty hours required for the degree as follows: Naval Science 301 and 302, three hours each, may be counted within the ninety Arts hours; and Naval Science 101, 102, 201, 202, three hours each, may be counted in the thirty hours allowed outside the College.



**PHYSICAL EDUCATION.** . . All undergraduates must pursue four terms of work, three hours a week, in physical education. This requirement must be completed in the first two years of residence; postponements are to be allowed only by consent of the University Faculty Committee on Requirements for Graduation.

Exemption from this requirement may be made by the Committee designated above, when it is recommended by the Medical Office, by the Department of Physical Education, or because of unusual conditions of age, residence, or outside responsibilities. An exemption recommended by the Department of Physical Education shall be given only to students who meet standards of physical condition established by the Department of Physical Education and approved by the Committee on Requirements for Graduation. Students who have been discharged from the armed services may be exempted.

For students entering with advanced standing, the number of terms of physical education required is to be reduced by the number of terms which the student has satisfactorily completed (whether or not physical education was included in his program) in a college of recognized standing. (See also the *Announcement of the Independent Divisions and Departments.*)

## HEALTH SERVICES AND MEDICAL CARE

**UNIVERSITY HEALTH REQUIREMENTS.** . . Each undergraduate student upon entering the University is expected to assume personal responsibility for the following health requirements adopted by the Board of Trustees of Cornell University. Permission to register for a new semester will not be granted unless all health requirements pertaining to the previous semester have been fulfilled.

1. *Vaccination.* A satisfactory certificate of vaccination against smallpox, on the form supplied by the University, must be submitted before registration. It will be accepted as satisfactory only if it certifies that within the last three years a successful vaccination has been performed or three unsuccessful vaccination attempts have been made. If this requirement cannot be fulfilled by the student's physician at home, opportunity for vaccination will be offered by the Cornell medical staff during the student's first semester, with the cost to be borne by the student. If a student has been absent from the University for more than three years, immunity will be considered to have lapsed.

2. *X-ray.* Every student is required to have a check of lungs, heart, and other chest structures by X-ray. He may present a chest film, made by a private physician, on or before entrance into the University provided that the film was secured within six months of initial registration and is of acceptable quality. Otherwise, he will be given opportunity to secure the chest X-ray at the University during the orientation period

or during his first semester; he has the responsibility for making the necessary arrangements with the University medical staff. The charge is included in the general University fee and covers any necessary recheck films. When a student has been away from the University for more than a year, he must have another X-ray upon re-entrance.

3. *Medical Examination.* Entering undergraduate students are required to have a medical examination. (This includes special students who must meet undergraduate requirements such as military training, physical education, etc.) An undergraduate student accepted for admission will be sent forms that are to be filled out by his home physician and returned promptly to the University Medical Clinic. A University physician will review the material before it becomes part of the student's permanent health record. All information given is confidential. During the orientation period, a specialized recheck of any questionable medical items will be made and, when the need for re-examination or follow-up is indicated, an appointment to consult a physician at the Clinic will be given. When a student has been away from the University for more than a year, he must, upon re-entrance, submit an interim health history on a form to be obtained from the medical office.

4. *Tetanus Toxoid.* Undergraduate students, including special students enrolled in one-year or two-year courses, are required to be immunized to tetanus through the use of tetanus toxoid. The University has adopted this rule to avoid reactions, often serious, if antitoxin (horse serum) is administered at the time of injury. Immunity through toxoid offers the advantage of protection without the risk of antitoxin (serum) reaction.

Active immunization is to be acquired within nine months prior to initial registration in the University unless the student's home physician is unable to give the toxoid. If there has been no previous immunization, an original series of two or three doses, depending upon the type used, spaced at least one month apart, will be necessary. This will be followed by a booster dose one year later.

If there has been previous immunization within ten years, reactivation by a single booster dose is required for entrance into the University. If previous immunization was ten or more years ago, two booster doses, spaced one month or more apart, are required.

After entrance into the University, five years is considered the maximum limit between booster doses, with a reactivating dose to be given at any time in case of injury.

Certification of immunization by the student's home physician is to be reported on a form supplied by the University.

Students unable to secure the immunization at home will be given the opportunity, during their first semester, to secure the toxoid from the University medical staff, for a fee of \$2. Opportunity to secure the



required booster dose one year later, without cost to the student, will also be given.

*FOR STUDENTS IN THE UNIVERSITY*...Health services and medical care are centered in the University Clinic or out-patient department in the Cornell Infirmary or hospital. Students are entitled to unlimited visits at the clinic; laboratory and X-ray examinations indicated for diagnosis and treatment; hospitalization in the Infirmary with medical care for a maximum of fourteen days each term and emergency surgical care. The cost for these services is included in the College and University general fee. For further details, including charges for special services, see the *General Information Announcement*.

### THE LIBRARIES

The central University Library is one of the chief assets of the College of Arts and Sciences. Its holdings, together with the collections in the college, school, and department libraries—housed in the various academic buildings—amount to more than 1,700,000 volumes. The Library ranks ninth in size among university libraries in the United States. To the rich resources assembled by the founders and by succeeding scholars and librarians, about 30,000 volumes are being added each year.

The Library not only provides the reference and collateral reading materials necessary for the support and enrichment of teaching and research but also has extensive collections of rare books, newspapers, maps, documents, manuscripts, microfilm, and microcards. Subscriptions to more than 4,000 periodicals are maintained. Many of the collections in special fields are distinguished for completeness of coverage and value of individual items.

A union catalogue includes the holdings of all libraries on the Ithaca campus. All books are available for use by undergraduates, although of necessity some must be used under restricted conditions.

Freshman students are scheduled for a library lecture-tour and problem as a means of becoming familiar with the facilities and services of the Library. All students, as well as the public, also enjoy a constantly changing series of exhibitions, displaying the specialized materials and treasures of the Library.

### RESIDENTIAL HALLS

Cornell University provides dormitory facilities for approximately 2,100 men in residential units on the campus. Undergraduate men who have been admitted to the University and have filed applications by July 1 are assured of places in the dormitories. Dining facilities are available in the student union building, Willard Straight Hall.

All undergraduate women are required to live and take their meals

in residential units maintained by the University or in sorority houses. Permission for undergraduate women to live elsewhere in Ithaca is granted under exceptional circumstances upon written application to the Dean of Women.

Application forms for living accommodations will be mailed to both men and women by the office of Admissions at the time of notification of provisional acceptance.

Detailed information concerning dormitory facilities may be obtained by writing directly to the office of Residential Halls, Edmund Ezra Day Hall.

## SCHOLARSHIPS AND PRIZES

Scholarships and prizes open to students of Arts and Sciences as members of the University are listed in the two Announcements, *Financial Aids and Scholarships* and *Prize Competitions*. Only students of Arts and Sciences are eligible for the scholarships and prizes described below.

*DEAN'S SCHOLARSHIPS*. . . These scholarships are open to men and women entering the College of Arts and Sciences. The annual awards vary from \$100 to \$1,500, depending upon financial need. The tenure is four years if the scholastic record of the recipient is creditable. At least twenty scholarships are awarded annually. January Scholastic Aptitude Test of the College Entrance Examination Board is required. Final selection and award are based upon academic promise, general character, and financial need. Preference will be given to candidates from areas not well represented in the present student body of the College of Arts and Sciences.

*THE SPENCER L. ADAMS SCHOLARSHIPS*. . . Two scholarships open to freshmen men. Annual award, \$800. Tenure is four years, provided academic standing in the upper fifth of the class is maintained. Preference will be shown to students majoring in the humanities, foreign language, or economics.

*THE GEORGE C. BOLDT MEMORIAL SCHOLARSHIPS*. . . George C. Boldt, Jr., has created three scholarships, each of them worth \$500, as a memorial to his father. These scholarships will be awarded at the close of the junior year to the three men students of the College who shall be considered most deserving of this aid. Applications for these scholarships must be filed in the office of the Dean before March 15 of the academic year preceding the year for which they are awarded. Students enrolled both in this College and in the Law School, the Medical College, or the Graduate School are not eligible.

*CHESTER BUCHANAN MEMORIAL SCHOLARSHIP*. . . A gift of Mrs. Claire F. Buchanan, in memory of her son, Chester Buchanan,

carries an annual stipend of \$200. It is awarded each year on the recommendation of the Department of Geology to the outstanding male senior who is majoring in this subject.

*THE CORNELIS W. DE KIEWIET SCHOLARSHIP*... Established by members of the Board of Trustees in honor of the former Acting President of Cornell University, this scholarship carries an annual award of \$300. It will be awarded to a student majoring in history who, at the end of his junior year, shows the greatest promise of creative work in history.

*THE CORNELIA L. HALL SCHOLARSHIP*... A gift of the late Mary F. Hall established the Cornelia L. Hall Scholarship, worth \$120, "open to any meritorious young woman of this State, who is pursuing the studies of the A.B. course and who is in need of financial assistance." Under the terms of the bequest, preference must be given to a suitable candidate from Tioga, Tompkins, or Chemung County; within this preferred class, women of senior or junior standing will be regarded as entitled to first consideration. Applications for the scholarship must be filed in the office of the Dean before March 15 of the academic year preceding the year for which it is awarded.

*MYRTLE H. MILLER SCHOLARSHIP*... This scholarship is open to men and women entering the College of Arts and Sciences. Annual award varies but may be as high as \$1,000. Tenure is four years. One scholarship will be awarded in 1956. January Scholastic Aptitude Test of the College Entrance Examination Board is required. Final selection and award are based upon academic promise, proficiency in mathematics, general character, and financial need.

*THE HENRY L. O'BRIEN, JR., SCHOLARSHIP*... This scholarship, established by the W. Alton Jones Foundation, Inc., in 1953, as a memorial to Henry L. O'Brien, Jr., is worth \$885 a year. It is awarded to a male citizen of the United States entering the College of Arts and Sciences as a freshman. It may be retained for four years if his scholarship record is satisfactory. Character, scholastic ability, need, and participation in extracurricular activities will be considered in awarding the scholarship.

*FREDERICK A. RICE SCHOLARSHIP ENDOWMENT*... This scholarship is the gift of Frederick A. Rice, '09, and Mrs. Frederick A. Rice, and is open to men students in the College of Arts and Sciences. The annual award is \$140, and the scholarship may be held for four years. Preference is given to candidates from California. Financial need, academic promise, and general character will be considered in making the award.

*WINTON G. ROSSITER SCHOLARSHIP*... This scholarship of \$250 is to be awarded annually to an outstanding senior in the College of Arts and Sciences, who, while earning a good part of his expenses through his own efforts, has nevertheless maintained a distinguished academic record and contributed substantially to the life of the University.

*KATHRYN BENDER WITMEYER SCHOLARSHIP*... This scholarship was established by Janet Witmeyer Bone. The annual award is \$100. It is available to a woman student in the College of Arts and Sciences. Academic ability, general character, and financial need will be considered in awarding this scholarship.

*UNION CARBIDE SCHOLARSHIPS*... Established by the Union Carbide and Carbon Corporation in 1955. Two of these scholarships are awarded each year to men or women entering the College of Arts and Sciences. The annual award at present is \$1,115 and covers tuition, fees, books, and supplies. These scholarships may be held for four years providing the recipient maintains an average placing him in the top half of his class. In selecting these scholars, interest and ability in research will be taken into consideration. This means that the applicant should be considering postgraduate work and should have shown evidence of the following characteristics—originality, imagination, self-confidence and courage, and an independent and questioning mind.

*THE GENERAL MOTORS SCHOLARSHIPS*... These scholarships were established by the General Motors Corporation in 1955. They are available to freshman men or women who are citizens of the United States and are entering the College of Arts and Sciences. The tenure is four years, providing the recipient maintains an average which will place him in the top half of his class term by term. Three scholarships will be available each year with a value of from \$200 to \$2,000, depending on the demonstrated need of the individual. Final selection and award are based upon outstanding academic promise, general character, and financial need.

*THE PROCTER AND GAMBLE SCHOLARSHIPS*... Established by the Procter and Gamble Company in 1955. Two of these scholarships are available each year to either men or women students entering the College of Arts and Sciences. The annual award presently amounts to \$1,115 and is designed to cover tuition, fees, books, and supplies. Tenure is four years, but to ensure continuance of the scholarship the recipient must maintain a term-by-term average in the top half of his class. Final selection is based upon academic promise and performance, general character, and financial need. One scholarship will be awarded to a student planning to study in the field of liberal arts, and the other to a student who is considering a major in a scientific area.

*THE GEORGE CHAPMAN CALDWELL PRIZE*...The George Chapman Caldwell Prize of \$50, established in 1913, is awarded, for general excellence in Chemistry, by the staff of the Department of Chemistry to a member of the senior class in Arts and Sciences with a major in Chemistry.

*THE BESS BERLOW COHAN PRIZE*...The Bess Berlow Cohan Prize of \$100, established in 1939, is awarded by a committee to the member of the senior class who has shown the greatest ability and progress in a combined study of Classics and English.

*THE JULIETTE MACMONNIES COURANT PRIZE*...The Juliette MacMonnies Courant Prize, founded by Mrs. Margaret MacMonnies Courant in 1921 in memory of her daughter, consists of about \$40. It is awarded by the Department of Romance Languages to a woman senior in the College of Arts and Sciences with a major in French who has made the best record for four years with special reference to facility of expression in French.

*THE CLYDE A. DUNIWAY PRIZE* of approximately \$40, established in 1945, is awarded annually to the best student in the College of Arts and Sciences graduating with a major in history or government. Payment of the prize is made by the establishment at the Cornell Campus Store of a credit to be used in the purchase of books on history or government. The prize is awarded by a joint committee consisting of a representative of each of the two departments. The committee takes into account the student's academic record, his ability to express himself clearly in speaking and writing, and his scholarly approach. To be eligible for consideration a student must have had advanced courses in each field.

*THE HAROLD ADLARD LOVENBERG PRIZE*...The Harold Adlard Lovenberg Prize of \$40, established in 1939, is awarded for general excellence, by the staff of the Department of Chemistry, to a member of the junior class in Arts and Sciences with a major in Chemistry.



# COURSES OF INSTRUCTION

THE FOLLOWING list of courses will be offered in the academic year 1956-1957. Courses numbered from 100 to 200 are, in general, introductory and may not be offered, save when so specified by the departments concerned, in partial satisfaction of major requirements. Branches or divisions of a subject are usually indicated through use of the hundreds place digit from 2 to 9 inclusive. Courses primarily for graduates, but open to undergraduates under certain conditions, bear numbers 75 or larger—Geology 395-396, Philosophy 575-576, etc. The courses open to freshmen are identified by asterisks. The student should read carefully the italicized statements preceding the offerings of each department and division in which he selects courses.

A list of rooms in which all lectures, recitations, and laboratory exercises are to be held will be distributed before the commencement of instruction.

## AMERICAN STUDIES

Mr. ROBERT H. ELIAS, *Chairman* (on leave, 1956-1957); Messrs. STUART M. BROWN, JR., DAVID B. DAVIS, DOUGLAS F. DOWD (*Acting Chairman*, 1956-1957), DEXTER PERKINS, CLINTON L. ROSSITER, ROBIN M. WILLIAMS, JR.

*The aim of major study in the interdepartmental program of American Studies is to enable the student (a) to understand the development of American civilization—its culture, its history, its economic, social, and political institutions—and the way that development is related to its backgrounds; (b) to become acquainted with various disciplines or approaches to the study of the United States; (c) to use a single discipline in advanced exploration.*

*Required courses (39 hours): (a) English 329-330, History 151-152, Philosophy 313; (b) a 6-hour sequence of social-science study devoted to the United States, chosen from the field of economics, government, or sociology, but not in the field of concentration; (c) American Studies 401-402; (d) 12 hours of concentrated, advanced work in American subjects within a single discipline: economics, government, history, literature, or sociology.*

*Related courses (12 hours): The courses shall be chosen from among those in European culture to supplement the required courses.*

*Courses satisfying the distribution requirements of the College may be used in satisfying required or related courses.*

*A fuller description of aims and requirements may be obtained from the Chairman.*

*Qualified students who wish to be candidates for Honors shall, in their senior year participate in the Honors program in the field of their concentration, and at the end of the year shall pass a comprehensive examination in American Studies. To enter the Honors program, a student must have a minimum cumulative average grade of 80 in all subjects and of 85 in major subjects, and must apply to the Chairman not later than November 2 of his junior year.*

301-302. *STUDIES IN AMERICAN CIVILIZATION: AMERICA AS A WORLD POWER.* Throughout the year. Credit three hours a term. Open to upperclassmen

and to sophomores who have had History 152 or Government 101. T Th S 10. Mr. PERKINS.

A study of American foreign policy with emphasis on its philosophical and ideological aspects as well as on the train of events.

401-402. *SEMINAR IN AMERICAN STUDIES*. Throughout the year. Credit three hours. Required of American Studies majors in the senior year and open to other specially qualified seniors with consent of instructor. Th 2-4. Mr. DAVIS.

An advanced course intended to raise central questions concerning the methods and assumptions of the various disciplines and the relation of these disciplines to each other.

## ASTRONOMY

Mr. R. W. SHAW, *Chairman*; Mr. J. P. COX.

*For a major in Astronomy the following courses must be completed: (1) in Astronomy, Courses 101 and 102, twelve hours of Interpretational Astronomy, six hours of Observational Astronomy, six hours of electives; (2) in related subjects, at least fifteen hours selected from approved courses in Chemistry, Geology, Mathematics, and Physics. Students who anticipate a major in Astronomy should complete Astronomy 101 and 102 not later than the sophomore year. Graduate students must register with the department on the regular registration days at the beginning of each term.*

\*101. *INTRODUCTION TO ASTRONOMY*. Fall term. Credit three hours. Lectures, T Th 11. Laboratory M T W Th 2-4:30. Mr. SHAW.

Fundamentals of astronomy with emphasis on the planets, moon, comets, meteors, and solar system as a unit, and telescopes. Observation at Fiertes Observatory.

\*102. *INTRODUCTION TO ASTRONOMY*. Spring term. Credit three hours. Lectures, T Th 11. Laboratory, M T W Th 2-4:30. Mr. SHAW.

Fundamentals of astronomy with emphasis on the sun, the stars, the galaxy, the sidereal universe, and spectroscopy. Observation at Fiertes Observatory.

[\*125. *AIR NAVIGATION*. Fall term. Credit three hours. M W F 10. Mr. SHAW. Not offered in 1956-1957.]

[\*127. *NAVIGATION AND NAUTICAL ASTRONOMY I*. Fall term. Credit three hours. Prerequisite, plane trigonometry. Mr. SHAW. Not offered in 1956-1957.]

[\*128. *NAVIGATION AND NAUTICAL ASTRONOMY II*. Spring term. Credit three hours. Prerequisite, plane trigonometry. M W F 10. Mr. SHAW. Not offered in 1956-1957.]

## INTERPRETATIONAL ASTRONOMY

221. *ORIGIN OF THE SOLAR SYSTEM*. Fall term. Credit three hours. Prerequisites, the calculus and Astronomy 101 (or consent of instructor). M W F 10. Mr. SHAW.

Analysis of proposed modes of origin and evolution of the solar system. Age determinations. Other planetary systems. General problem of cosmogony.

[223. *INTRODUCTION TO ASTROPHYSICS*. Fall term. Credit three hours. Prerequisites, the calculus and Astronomy 102 (or consent of instructor). M W F 12. Mr. COX. Not offered in 1956-1957.]

[226. *THEORY OF ORBITS*. Fall term. Credit three hours. Prerequisites, the calculus and consent of the instructor. STAFF. Not offered in 1956-1957.]

231. *STELLAR STRUCTURE*. Fall term. Credit three hours. Prerequisites, the calculus and Astronomy 223. M W F 12. Mr. COX.

Basic observations of stellar masses, luminosities, and diameters. Stellar atmospheres. Energy sources. Theory of internal structure.

[238. *ASTROCHEMISTRY*. Spring term. Credit three hours. Prerequisites, the calculus and Astronomy 223. Mr. SHAW. Not offered in 1956-1957.]

259. *SPECIAL TOPICS IN ASTRONOMY*. Fall or spring term. Credit one to three hours. Prerequisite, consent of instructor. STAFF.

Qualified students may receive instruction in selected topics according to their needs and preparation. Topics occasionally given formally include Optics and Instrument Design, Comets and Meteors, Binary Star Systems, and Radio Astronomy.

275. *THEORETICAL ASTROPHYSICS*. Spring term. Credit three hours. Prerequisites, Differential Equations and Astronomy 231 or 238. M W F 12. Mr. COX.

Special and general theory of relativity. Milne's kinematic relativity. Cosmological models. Red shift of extragalactic nebulae. Origin of chemical elements. Evolution of stars and galaxies.

295. *ADVANCED STUDY AND RESEARCH*. Either term. Credit variable. Prerequisite, consent of instructor. STAFF.

## OBSERVATIONAL ASTRONOMY

[461. *ASTRONOMICAL SPECTROSCOPY*. Fall term. Credit three hours. Prerequisite, consent of instructor. Mr. SHAW. Not offered in 1956-1957.]

464. *ASTROMETRY*. Spring term. Credit three hours. Prerequisite, consent of instructor. Lectures to be arranged. Laboratory F 2-4:30. Mr. SHAW.

Observational methods and techniques. Visual binaries. Coordinate measuring machine, micrometer, photoelectric photometry, and astronomical photography.

[468. *GEODETIC ASTRONOMY*. Spring term. Credit three hours. Prerequisite, consent of instructor. Mr. SHAW. Not offered in 1956-1957.]

## BOTANY

Mr. H. P. BANKS, *Chairman*; Messrs. D. W. BIERHORST, W. D. BONNER, JR., D. G. CLARK, R. T. CLAUSEN, J. M. KINGSBURY, L. F. RANDOLPH, F. C. STEWARD, J. F. THOMPSON, C. H. UHL, C. S. YOCUM.

*For a major in Botany the student must complete Courses 1 and 117 and two of the following courses: 31, 123, 124, 126, 127; and in addition one course of three or four hours' credit in the field of Botany. In related subjects eighteen hours must be selected from approved courses in Bacteriology, Biochemistry, Chemistry, Entomology, Geology, Physics, Plant Pathology, and Zoology. Genetics 101 may be offered either as a course in Botany or in the related subjects.*

*For a major in Botany with advanced work in Bacteriology, the following courses must be completed: Botany, Courses 1, 31, 117; in Bacteriology, eight hours of advanced courses approved by the Department of Botany; (2) in related subjects, eighteen hours to be selected from the list given in the paragraph above.*

*Provisions are made for a limited number of students to undertake informal study.*

\*1. *GENERAL BOTANY*. Throughout the year, but may be entered in the spring term. Credit three hours a term. If taken after general biology, credit two hours a term. Lectures, T Th 9 or 11. Laboratory, M T W Th or F 2-4:30; T 10-12:30; F or S 8-10:30; or S 9-11:30. Mr. BANKS and instructors.

A survey of the fundamental facts and principles of plant life. The work of the first term deals with the structures and functions of the higher plants, with special emphasis on their nutrition. The work of the second term traces the evolution of



the plant kingdom, as illustrated by representatives of the principal groups, and concludes with a brief introduction to the principles of classification of the flowering plants.

31. *PLANT PHYSIOLOGY*. Either term. Credit four hours. Prerequisite, Botany 1, or biology, and introductory chemistry. Lectures, T Th 10. Laboratory, T Th 2-4:30, W F 2-4:30, or M 2-4:30, S 8-10:30. Mr. CLARK.

This course is designed to acquaint the student with the general principles of plant physiology. Topics such as water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction are studied in detail. Particular emphasis is placed, both in laboratory and in classroom, on discussion of principles and their application to plants.

112. *FRESHWATER ALGAE*. Fall term. Credit three hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 11. Laboratory, F 2-4:30. Mr. KINGSBURY.

A comprehensive survey of the freshwater algae, including structure, ecology, physiology, economic importance, and evolution where appropriate. The laboratory is designed, in addition to furnishing illustrative material for lecture topics, to provide a working familiarity with the local algal flora.

113. *MARINE ALGAE AND THE BRYOPHYTES*. Spring term. Credit three hours. Prerequisite, course 1 or course 112. Lectures, T Th 11. Laboratory, F 2-4:30. Mr. KINGSBURY.

Although a continuation of course 112, this course is designed to be complete in itself. It includes a survey of the groups of the brown and red algae, a discussion of the landward migration, and surveys of the liverworts, hornworts, and mosses.

117. *TAXONOMY OF VASCULAR PLANTS*. Fall term. Credit four hours. Prerequisite, Botany 1 or its equivalent and permission to register. Lectures, T Th 9. Laboratory, T Th 2-4:30. Mr. CLAUSEN.

A survey of the kinds of seed-plants and ferns, their classification, gross morphology, geographical distribution, and economic importance, together with an introduction to the principles and literature of taxonomy. Methods of identification are stressed.

118. *TAXONOMY AND ECOLOGY OF VASCULAR PLANTS, ADVANCED COURSE*. Spring term. Credit four hours. Prerequisite, Botany 117 and either Botany 124 or Genetics 101 and permission to register. Lectures, T Th 9. Laboratory, T Th 2-4:30. Mr. CLAUSEN.

A continuation of Botany 117, including a consideration of evolutionary patterns in the seed plants and ferns; a demonstration of the principles and methods of taxonomy; and an introduction to problems of classification in the flora of North America. Trips will be scheduled in laboratory periods and on several Sundays in the second half of the term.

123. *PLANT ANATOMY*. Fall term. Credit four hours. Prerequisite, Botany 1 or its equivalent and permission to register. Lectures, T Th 9. Laboratory, either M W 2-4:30 or T Th 10-12:30. Mr. BIERHORST.

A detailed study of the internal structure of vascular plants with emphasis on determination and interpretation.

124. *CYTOLOGY*. Fall term. Credit four hours. Prerequisite, Botany 1 or Zoology 101-102 or its equivalent. Lectures, M W 9. Laboratory, M W or T Th 10-12:30. Assignment to laboratory section must be made at time of registration. Mr. UHL.

The principal topics considered are protoplasm, cells and their components, nuclear and cell division, meiosis and fertilization, and the relation of these to the problems of development, reproduction, taxonomy, and heredity. Both plant and animal materials are used.

125. *MICROTECHNIQUE*. Spring term. Credit two hours. Prerequisites, Botany 1 and permission to register. Hours to be arranged. Mr. UHL.

A laboratory course in methods of preparing plant material for microscopical study.

[126. *MORPHOLOGY OF VASCULAR PLANTS*. Spring term. Credit four hours a term. Prerequisites, Botany 1 or its equivalent, and permission to register. Lectures, M W 1:30-2:30. Laboratory M W 2:30-5:00. Mr. BIERHORST. Not given in 1956-1957.]

An advanced course in the comparative morphology, life histories, and phylogeny of the lower vascular plants, both fossil and recent.

127. *MORPHOLOGY OF VASCULAR PLANTS*. Spring term. Credit four hours a term. Prerequisites, Botany 1 or its equivalent, and permission to register. Lectures, M W 1:30-2:30. Laboratory, M W 2:30-5:00. Mr. BIERHORST.

An advanced course in the comparative morphology, life histories, and phylogeny of the higher vascular plants, both fossil and recent.

171. *SPECIAL PROBLEMS IN GENERAL BOTANY, TAXONOMY, MORPHOLOGY, ANATOMY, PALEOBOTANY, CYTOLOGY, AND PHYSIOLOGY*. Throughout the year. Credit not less than two hours a term. Hours by appointment.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem.

217. *SEMINAR IN TAXONOMY OF VASCULAR PLANTS*. Spring term. Required of graduate students taking work in taxonomy. Prerequisite, Botany 118. Conference, M 4:30. Mr. CLAUSEN.

A consideration of current research and literature; reports on problems of research by graduate students and members of the staff.

224. *CYTOGENETICS*. Spring term. Credit three hours. Prerequisites, Botany 124 and Genetics 101 or their equivalent. Lectures, M W 9. Laboratory, M or W 10-12:30. Mr. RANDOLPH.

An advanced course dealing mainly with the chromosome mechanism of heredity and with recent researches in cytology, cytotaxonomy, and cytogenetics.

231. *PLANT PHYSIOLOGY, ADVANCED LECTURE COURSE*. Throughout the year. Credit three hours a term. Limited to seniors and graduate students. Prerequisite, training in botany and chemistry, to be determined in each case by the professor in charge. Lectures, M W F 10. Mr. STEWARD.

232. *PLANT PHYSIOLOGY, ADVANCED LABORATORY COURSE*. Throughout the year. Credit three hours a term. Prerequisite or parallel, Botany 231. Laboratory, T Th or W F 2-5:30. Mr. BONNER.

233. *SEMINAR IN PLANT PHYSIOLOGY*. Fall and spring terms. Required of graduate students in plant physiology and open to all who are interested. F 11. Messrs. BONNER, CLARK, STEWARD, THOMPSON, and YOCUM.

The discussion of current problems in plant physiology and the presentation of reports on the research of graduate students and members of the staff.

234. *PLANT PHYSIOLOGY, ADVANCED LECTURE COURSE*. Fall term. Credit one hour. Prerequisite, Botany 231 or adequate preparation in botany and chemistry. W 8. Mr. BONNER.

This course deals primarily with physiology in relation to hormones, photo-periodism, and vernalization.

## CHEMISTRY

Mr. FRANKLIN A. LONG, *Chairman*; Messrs. SIMON H. BAUER, RICHARD BERSOHN, ALFRED T. BLOMQUIST, W. DONALD COOKE, RICHARD M. DIAMOND, DAVID A. DOWS, PAUL J. FLORY, ROBERT M. HEXTER, JAMES L. HOARD, JOHN R. JOHNSON, ALBERT W. LAUBENGAYER, JERROLD MEINWALD, WILLIAM T. MILLER, MELVIN L. NICHOLS, DONALD D. PHILLIPS, ROBERT A. PLANE, R. F. PORTER, HAROLD A. SCHERAGA, MICHELL J. SIENKO, BENJAMIN WIDOM.

*All courses listed below, except Chemistry 224 (fall term) and 307-308 will be given in the Baker Laboratory of Chemistry.*

*For a major in Chemistry the following courses must be completed: (1) in Chemistry: 105-106 and 201, or preferably 111-112 and 115-116; 224; 307-308, 311-312; 407-408, 411-412; and at least six additional hours in Chemistry, to include any two of the following advanced courses: 245, 320, 431, and 575. (2) in related subjects: Mathematics 161 or 181, 162, 182 or 192, and 163, 183, or 193; Physics 107 and 108; German 101, unless two units have been offered for entrance.*

*Acceptance of a student for the major may be deferred by the major adviser until the second term of the sophomore year. Generally a student is not encouraged to undertake the major unless his performance in chemistry, physics, and mathematics courses affords evidence of his capacity to do satisfactory work at a more advanced level.*

*The Honors program in chemistry offers the superior student an opportunity to do informal study in seminars and gain experience in research during his senior year. It is particularly recommended to those who plan to continue in chemistry after graduation. Completion of the program at a high level of performance leads to the degree of Bachelor of Arts with Honors in Chemistry.*

*The requirements for admission to the Honors program are a cumulative average grade of at least 80 and permission of the department. Prospective candidates for Honors should discuss their plans with their advisers by April 15 of their junior year. Candidates for Honors must complete courses 601 and 602 and offer at least 3 hours of Honors research from Courses 603 and 604.*

## INORGANIC CHEMISTRY

Students exceptionally well prepared in chemistry should read the section on p. 14 in regard to college credit examinations.

\*101-102. **GENERAL CHEMISTRY.** Throughout the year. Credit three hours a term. Chemistry 101 is prerequisite to Chemistry 102. A terminal course for those students who do not intend to take more chemistry. Will not serve as a prerequisite for more advanced courses in chemistry. Open to those who have had or have not had high school chemistry. Lectures: fall term, M F 11; spring term, M F 10. Combined discussion-laboratory period, M T W Th or F 1:40-4:30. Mr. DIAMOND and assistants.

Emphasis on the more important chemical principles and facts, on the scientific method, and on the relation of chemistry to the other fields of knowledge and to everyday life.

\*105-106. **GENERAL CHEMISTRY.** Throughout the year. Credit three hours a term. Chemistry 105 is prerequisite to Chemistry 106. For those students who will take more chemistry, it serves as a prerequisite to the more advanced courses. Open to those who have had or have not had high school chemistry. May be elected by students who do not intend to take more chemistry. Lectures, T Th 9, 10, or 12. Combined discussion-laboratory period, M W F or S 8-11, M T W Th or F 1:40-4:30. Mr. SIENKO, Mr. PLANE, Mr. DOWS, and assistants.

The important chemical principles and facts will be covered, with considerable attention given to the quantitative aspects and to the techniques which are important for further work in chemistry.

**\*111-112. INTRODUCTORY INORGANIC CHEMISTRY.** Throughout the year. Credit three hours a term. Chemistry 111 is prerequisite to Chemistry 112. Chemistry 115-116 must be taken with Chemistry 111-112, except by consent of the instructor. Open to those students who have offered high school chemistry for entrance. Required of candidates for the degree of B.Ch.E. and recommended for candidates for the degree of A.B. with a major in chemistry. Lectures, M W F 8. Mr. LAUBENGAYER.

A study of the concepts and laws of inorganic chemistry and a systematic treatment of the common elements and their compounds based on atomic structure and the Periodic System.

**\*115-116. INTRODUCTORY INORGANIC LABORATORY AND QUALITATIVE ANALYSIS.** Throughout the year. Credit three hours a term. Chemistry 115 is prerequisite to Chemistry 116. Must be taken with Chemistry 111-112. Laboratory, T Th 8-11, W F 10-1, or W 1:40-4:30 and S 10-1. Recitation, one hour a week, to be arranged. Mr. LAUBENGAYER, Mr. HEXTER, Mr. PORTER, and assistants.

The theories of chemistry are applied in a study of the preparation and properties of the common elements and their compounds and in the separation and detection of their ions.

**575-576. ADVANCED INORGANIC CHEMISTRY.** Throughout the year. Credit three hours a term. Prerequisite or parallel courses, Chemistry 403-404 or 407-408, or consent of the instructor. Chemistry 575 is prerequisite to Chemistry 576. Open to upperclassmen and graduate students. Lectures M W F 11. Mr. LAUBENGAYER.

Theories of atomic structure and chemical bonding are applied systematically to the elements as they appear in the Periodic System, with emphasis on the stereochemistry of inorganic substances.

**580. ADVANCED INORGANIC LABORATORY.** Either term. Credit two to six hours. Prerequisite, Chemistry 224 and 312 and consent of the instructor. Chemistry 580 is designed to accompany Chemistry 575-576 but may be taken separately. Hours to be arranged. Messrs. DIAMOND, LAUBENGAYER, PLANE, and SIENKO.

Laboratory practice. The preparation, purification, properties, and reactions of inorganic compounds, including those of the rarer elements.

**585-586. SELECTED TOPICS IN ADVANCED INORGANIC CHEMISTRY.** Throughout the year. Credit two hours a term. Students may register for either term separately. Prerequisite, Chemistry 404 or 408 and consent of the instructor. Instructors and topics to be announced. Lectures, T Th 12.

Detailed consideration is given each term to one or two special topics selected from the field of theoretical and experimental inorganic chemistry. Topics are varied from year to year.

## ANALYTICAL CHEMISTRY

**\*201. INTRODUCTORY QUALITATIVE ANALYSIS.** Either term. Credit four hours. Prerequisite, Chemistry 106. Enrollment may be limited, especially in the fall term. Lectures, M W 12. Laboratory, T Th 1:40-4:30 (either term) or T Th 8-11 (fall term only). Mr. BERSOHN and assistants.

A study of the properties and reactions of the common elements and acid radicals and their detection in various solutions and solids.

215. *ELEMENTARY QUANTITATIVE ANALYSIS*. Spring term. Credit four hours. Prerequisite, Chemistry 201, or 112 and 116. Primarily for students in the premedical and biological curricula. Lectures, M W 12. Laboratory, M W or T Th 2-4:30, or T Th 8-10:30. Mr. COOKE, Mr. NICHOLS, Mr. PORTER, and assistants.

A study of the fundamental theory and experimental techniques of colorimetric, gravimetric, and volumetric analyses. Also a brief survey of selected topics in modern analytical techniques.

224. *INTRODUCTORY QUANTITATIVE ANALYSIS*. Either term. Credit four hours. Prerequisite, Chemistry 201, or 112 and 116. Required of candidates for the degrees of B.Ch.E. and A.B. with a major in chemistry. Lectures, M W 10. Laboratory, F 1:40-4:30 and S 9-12 (either term), T Th 9-12 (fall term only), or T Th 1:40-4:30 (spring term only). Mr. COOKE, Mr. NICHOLS, Mr. PORTER, and assistants.

A study of the fundamental principles of gravimetric and volumetric analysis, with practice in stoichiometry, and the analyses of a variety of substances by volumetric, gravimetric, and colorimetric methods.

245. *INSTRUMENTAL ANALYSIS*. Spring term. Credit three hours. If taken after Chemistry 290 or 292, credit two hours. Prerequisite, Chemistry 403 or 407, or consent of the instructor. Laboratory may be taken separately by graduate students who have completed Chemistry 290 or 292. Enrollment is limited. Lectures, T Th 10. Laboratory, one afternoon a week, to be arranged. Mr. COOKE and assistant.

A discussion of the broad aspects of modern analytical chemistry including electro-metric titrations; polarography; visible, ultraviolet, and infrared spectroscopy; chromatography and ion exchange; mass spectrometry. Laboratory work will include experiments in each of the above fields.

265. *ADVANCED ANALYTICAL LABORATORY*. Either term. Credit two to six hours. Prerequisite, consent of instructor. Hours and place to be arranged. Mr. COOKE and Mr. NICHOLS.

275. *QUANTITATIVE MICROANALYSIS*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Primarily for graduate students. Enrollment is limited. Laboratory, W or F 9-5. Mr. NICHOLS and assistant.

Laboratory practice in typical methods of both organic and inorganic quantitative microanalysis.

280. *SPECTROCHEMICAL ANALYSIS FOR ELEMENTS*. Spring term. Credit three hours. Prerequisites, Chemistry 403 or 407, and 411, or consent of the instructor. Enrollment is limited to 12 students. Lectures, T Th 9. Laboratory, one afternoon a week, to be arranged. Mr. BAUER and assistant.

The theory and practice of elementary spectrochemical analysis will be discussed in the lectures and illustrated in the laboratory. Qualitative and quantitative analyses of unknowns will be assigned in a sequence of graded complexity.

[285. *SPECTROCHEMICAL ANALYSIS FOR MOLECULAR GROUPS*. Fall term. Credit three hours. Prerequisite, Chemistry 280 or 245. Enrollment is limited to 6 students. One lecture and two laboratory periods a week, to be arranged. Mr. BAUER and assistant.

The theory and practice of analysis of compounds for selected molecular groupings, using infrared, Raman, ultraviolet, and fluorescence spectroscopy. Qualitative and quantitative unknowns will be assigned. Given in alternate years. Not offered in 1956-1957.]

290. *ADVANCED ANALYTICAL CHEMISTRY*. Fall term. Credit three hours. Prerequisite, Chemistry 404 or 408. Primarily for graduate students. Lectures, M W F 8. Mr. COOKE.



A study of the application of modern analytical methods to chemical problems. Topics discussed include polarography and other electrochemical methods, non-aqueous titrations, chromatography, ion exchange, nuclear methods, and mass spectrometry. Given in alternate years.

[292. *ADVANCED ANALYTICAL CHEMISTRY*. Fall term. Credit three hours. Prerequisite, Chemistry 404 or 408. Primarily for graduate students. Lectures, M W F 8. Mr. COOKE.

The application of optical methods to analytical problems. Topics discussed include colorimetry; visible, ultraviolet, infrared, and Raman spectroscopy; fluorescence and other optical procedures. Given in alternate years. Not offered in 1956-1957.]

## ORGANIC CHEMISTRY

301. *INTRODUCTION TO ORGANIC CHEMISTRY*. Fall term. Credit two hours. Prerequisite, Chemistry 106. For students in engineering. Lectures, W F 9. Mr. BLOMQUIST.

A brief survey of the principal classes of organic compounds, their industrial sources, manufacture, and utilization.

303. *ELEMENTARY ORGANIC CHEMISTRY*. Either term. Credit four hours. Prerequisite, Chemistry 106. Chemistry 201 is desirable but not required. Enrollment may be limited, especially in the fall term. Chemistry 305 must be taken with Chemistry 303. Primarily for students in the premedical and biological curricula. Lectures, M W F S 11. Mr. MEINWALD.

An integrated study of aliphatic and aromatic organic compounds, their occurrence, methods of preparation, reactions, and uses. The relationship of organic chemistry to the biological sciences is stressed.

The student should determine the entrance requirement in organic chemistry for the particular medical school he wishes to enter. Students may obtain six hours' credit by taking Chemistry 303 and 305. An additional two hours' credit in laboratory may be obtained by taking Chemistry 306.

305. *ELEMENTARY ORGANIC LABORATORY*. Either term. Credit two hours. Must be taken with Chemistry 303. Laboratory, M W or T Th 2-4:30. Mr. MEINWALD and assistants.

Laboratory experiments on the preparation and reactions of typical aliphatic and aromatic organic compounds.

306. *ORGANIC LABORATORY*. Spring term. Credit two hours. Prerequisite, Chemistry 303 and 305. Laboratory, M W 2-4:30. Mr. MEINWALD and assistants.

A continuation of Chemistry 305.

307-308. *INTRODUCTORY ORGANIC CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 106 or 112. Qualitative analysis is desirable but not required. Chemistry 307 is prerequisite to Chemistry 308. Chemistry 311-312 must be taken with Chemistry 307-308. Required of candidates for the degrees of B.Ch.E. and A.B. with a major in chemistry. Lectures, M W F 8. Mr. JOHNSON.

A systematic study of the more important classes of carbon compounds, reactions of their functional groups, methods of synthesis, relations, and uses.

311-312. *INTRODUCTORY ORGANIC LABORATORY*. Throughout the year. Credit two hours a term. Chemistry 311 is prerequisite to Chemistry 312. Must be taken with Chemistry 307-308. Required of candidates for the degrees of B.Ch.E. and A.B. with a major in chemistry. Laboratory lecture for all sections, Th 12.



Laboratory, T Th 1:40-4:30 or F 1:40-4:30 and S 9-12 (either term) or T Th 9-12 (fall term only). Mr. PHILLIPS and assistants.

The student prepares typical compounds of carbon and familiarizes himself with their properties, reactions, and relations.

**320. IDENTIFICATION OF ORGANIC COMPOUNDS.** Either term. Credit four hours. Prerequisite, Chemistry 307-308 and 311-312, at grades of 75 or better. Enrollment may be limited. Lectures, T Th 8. Laboratory: fall term, T Th 2-4:30, or F 2-4:30 and S 10-12:30; spring term, W 2-4:30 and F 2-4:30 or S 10-12:30. Mr. MILLER and assistants.

The classification reactions of organic compounds and the preparation of solid derivatives are applied to the identification of unknown organic substances.

**330. ADVANCED ORGANIC LABORATORY.** Either term. Credit two to four hours. Prerequisites, Chemistry 320 and consent of the instructor. Primarily for seniors and graduate students as preparation for advanced and independent work. Enrollment limited for undergraduates to those having a record of 80 or better in prerequisite courses. Laboratory, hours to be arranged. Messrs. BLOMQUIST, JOHNSON, MEINWALD, MILLER, and PHILLIPS.

An advanced course in organic synthetic procedures, involving preparation of intermediates for organic research and use of standard reference works.

**365-366. ADVANCED ORGANIC CHEMISTRY.** Throughout the year. Credit three hours a term. Prerequisite, Chemistry 320 or consent of the instructor. Primarily for seniors and graduate students intending to do advanced work in organic chemistry or related fields. Enrollment limited for undergraduates to those having a record of 80 or better in prerequisite courses. Lectures, M W F 12. Mr. BLOMQUIST.

Fall term: stereochemistry, general survey of reaction mechanisms, systematic coverage of various classes of organic compounds, starting with hydrocarbons. Spring term: continuation to other classes of organic compounds with special consideration being given to tautomerism, molecular rearrangements, etc.

**[375-376. SELECTED TOPICS IN ORGANIC CHEMISTRY.** Fall term. Credit two hours. Prerequisite, Chemistry 365-366 or consent of the instructor. Primarily for graduate students. Lectures, T Th 9. Mr. MEINWALD.

Organic compounds of nitrogen and sulfur, the simpler heterocycles, and alicyclic compounds. Given in alternate years. Not offered in 1956-1957.]

**380. ORGANIC CHEMISTRY OF HIGH POLYMERS.** Fall term. Credit two hours. Prerequisite, Chemistry 365-366 or consent of the instructor. Primarily for graduate students. Lectures, M W 11. Mr. MILLER.

The mechanism of polymerization processes and the chemical structure and properties of high polymers, with examples chosen from the more significant natural and synthetic high molecular weight materials. Given in alternate years.

**[385. PHYSICAL ASPECTS OF ORGANIC CHEMISTRY.** Spring term. Credit two hours. Prerequisite, Chemistry 320 or 365-366, and consent of the instructor. Primarily for graduate students. Lectures, M W 11. Mr. MILLER.

A discussion of recent theoretical developments in organic chemistry and their application to typical reactions. Given in alternate years. Not offered in 1956-1957.]

**395-396. CHEMISTRY OF NATURAL PRODUCTS.** Throughout the year. Credit two hours a term. Prerequisite, Chemistry 320 or 365-366. Primarily for graduate students. Open to undergraduates by consent of the instructor. Students may register for either term separately. Lectures, T Th 9. Mr. PHILLIPS.

Fall term: alkaloids, terpenes, antibiotics, and plant pigments. Spring term: proteins, carbohydrates, vitamins, and steroids. Given in alternate years.

## PHYSICAL CHEMISTRY

401. *INTRODUCTION TO PHYSICAL CHEMISTRY*. Fall term. Credit three hours. Prerequisites, Chemistry 106, Mathematics 163, 183 or 193, and Physics 117. Primarily for students in Electrical Engineering. Lectures, T Th 9; recitation, to be arranged. Mr. BAUER and assistant.

A brief survey of physical chemistry. Problems of interest to students in engineering will be discussed.

402. *INTRODUCTION TO PHYSICAL CHEMISTRY*. Spring term. Credit two hours. Prerequisite, Chemistry 106. Prerequisite or parallel courses, Mathematics 163, 183 or 193 and Physics 117. For students in Civil and Mechanical Engineering. Lectures, W F 9. An additional recitation period will be arranged for Engineering Physics students and others who wish to obtain three hours credit for the course. Mr. BAUER and assistants.

A brief survey of physical chemistry. Problems of interest to students in engineering will be discussed.

403-404. *INTRODUCTORY PHYSICAL CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 224 and 308, Mathematics 163, 183 or 193, and Physics 118. Chemistry 403 is prerequisite to Chemistry 404. Required of candidates for the degree of B.Ch.E. Lectures M W F 9. Mr. SCHERAGA.

A systematic treatment of the fundamental principles of physical chemistry. The laws of thermodynamics and of the kinetic theory are applied in a study of the properties of gases, liquids and solids, thermochemistry, properties of solutions, and equilibrium in homogeneous and heterogeneous systems. Chemical kinetics and atomic and molecular structure are also studied.

407-408. *INTRODUCTORY PHYSICAL CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 163, 183 or 193, Physics 107 and 108, and Chemistry 215 or 224; or consent of the instructor. Chemistry 407 is prerequisite to Chemistry 408. Required of candidates for the degree of A.B. with a major in chemistry. Lectures, M W F 10. Mr. HOARD.

A study of elementary principles and methods of physical chemistry and their applications to the chemical and physical properties of matter. Specific topics include gases, liquids, solids, molecular structure, the laws of thermodynamics, solutions, physical and chemical equilibria, chemical kinetics, and electrochemical systems.

411-412. *INTRODUCTORY PHYSICAL LABORATORY*. Throughout the year. Credit two hours a term. Prerequisite or parallel course, Chemistry 403-404 or 407-408. Chemistry 411 is prerequisite to Chemistry 412. Enrollment may be limited. Required of candidates for the degrees of B.Ch.E. and A.B. with a major in chemistry. Laboratory, M T or Th F 2-4:30. Mr. HOARD, Mr. SCHERAGA, Mr. WIDOM, and assistants.

Quantitative experiments illustrating the principles of physical chemistry, and practice in performing typical physicochemical measurements. A part of the scheduled time is used for the discussion of experiments rather than for laboratory work.

416. *CHEMICAL BONDING AND PHYSICAL PROPERTIES OF ORGANIC MOLECULES*. Spring term. Credit three hours. Prerequisite, Chemistry 106. Lectures T Th S 9. Mr. BERSOHN.

Primarily for students who have had no course in organic chemistry but a good background in physics. The course emphasizes the physical rather than the chemical properties of organic compounds.

420. *ADVANCED LABORATORY PRACTICE IN PHYSICAL CHEMISTRY*. Either term. Credit two to six hours. Prerequisite, consent of the instructor. Hours and

place to be arranged. Messrs. BAUER, BERSOHN, FLORY, HOARD, LONG, SCHERAGA, and WIDOM.

431. *ADVANCED PHYSICAL CHEMISTRY*. Fall term. Credit three hours. Prerequisite, Chemistry 404 or 408. M W F 9. Mr. HEXTER.

A discussion of advanced topics in physical chemistry, including an introduction to the principles of quantum theory and statistical mechanics, atomic and molecular spectra, elementary modern valence theory, and physical methods for determining molecular structure.

[440. *COLLOID CHEMISTRY*. Spring term. Credit two hours. Prerequisite, Chemistry 404 or 408. Lectures, T Th 11 and occasionally S 11. Mr. SCHERAGA.

Physical chemistry of surfaces and colloids, including intermolecular forces, thermodynamic and electrical properties of interfaces, electrokinetic phenomena, interaction between colloidal particles, stability of lyophobic colloids, and properties of colloidal solutions. Given in alternate years. Not offered in 1956-1957.]

[448. *PHYSICAL CHEMISTRY OF PROTEINS*. Spring term. Credit two hours. Prerequisite, Chemistry 404 or 408. Primarily for graduate students. Lectures, T Th 11 and occasionally S 11. Mr. SCHERAGA.

Chemical constitution, molecular weight, and structural basis of proteins; thermodynamic, hydrodynamic, optical and electrical properties; protein and enzyme reactions. Given in alternate years. Not offered in 1956-1957.]

455. *KINETICS OF CHEMICAL REACTIONS*. Spring term. Credit three hours. Prerequisite, Chemistry 404 or 408. Primarily for graduate students. Open to undergraduates by consent of the instructor. Lectures, M W F 11. Mr. LONG.

A general discussion of rates of reaction including types of reactions, methods of measurement, theories of reaction rates, application to problems.

[461. *RADIOCHEMISTRY*. Fall term. Credit three hours. Prerequisite, Chemistry 404 or 408, or consent of the instructor. Primarily for graduate students. Lectures, T Th S 9. Mr. DIAMOND.

A discussion of properties of the nucleus; spontaneous and induced nuclear reactions; radioactivity measurement; applications of radioisotopes and chemical techniques in the investigation of nuclear phenomena. Given in alternate years. Not offered in 1956-1957.]

472. *THERMODYNAMICS*. Spring term. Credit four hours. Prerequisite, Chemistry 404 or 408. Primarily for graduate students. Lectures, M W F 9 and an additional hour to be arranged. Mr. FLORY.

Development of the general equations of thermodynamics from the first and second laws. Applications to the study of physiochemical equilibria in gases, liquids, solids, and liquid solutions. Problems.

[480. *STATISTICAL MECHANICS*. Fall term. Credit three hours. Prerequisite, Chemistry 491 or equivalent is desirable but not required. Primarily for graduate students. Lectures, M W F 9. Mr. BERSOHN.

An introduction to equilibrium and non-equilibrium statistical mechanics, with particular emphasis on physicochemical applications; calculation of thermodynamic functions; equation of state of gases and liquids; properties of crystals; condensation; transport phenomena (diffusion, viscosity, thermal conductivity) of gases and liquids. Given in alternate years. Not offered in 1956-1957.]

482. *PHYSICAL CHEMISTRY OF HIGH POLYMERS*. Spring term. Credit two hours. Prerequisite, Chemistry 380 and 472, or consent of instructor. Primarily for graduate students. Lectures, M W 11. Mr. FLORY.

The physical chemistry of high polymers and their solutions in the light of modern theories, and the principles underlying quantitative interpretation of molecular weight, structure, and properties of polymeric substances. Given in alternate years.

[485. *X-RAY CRYSTALLOGRAPHY*. Spring term. Credit three hours. Prerequisite, Physics 225 or consent of the instructor. M W F 12. Mr. HOARD.

Space groups, reciprocal lattices, three dimensional diffraction, interpretation of X-ray diffraction data, structure determination by Fourier synthesis. Given in alternate years. Not offered in 1956-1957.]

491. *INTRODUCTION TO QUANTUM MECHANICS*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Primarily for graduate students. Lectures, T Th S 10. Mr. BERSOHN.

Elementary presentation of the fundamentals of quantum mechanics. Given in alternate years.

492. *QUANTUM MECHANICS OF VALENCE*. Spring term. Credit three hours. Prerequisite, Chemistry 491 or its equivalent. Primarily for graduate students. Lectures, M W F 9. Mr. BERSOHN and Mr. HEXTER. Given in alternate years.

[495. *MOLECULAR SPECTRA*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Primarily for graduate students majoring in physical chemistry and physics. Lectures, hours to be arranged. Mr. BAUER.

Description of various types of molecular spectra. The rotational and vibrational spectra of polyatomic molecules (energy levels, normal coordinate treatment, selection rules). Relations between molecular structure and molecular constants. Given in alternate years. Not offered in 1956-1957.]

601-602. *HONORS SEMINAR*. Throughout the year. Credit one hour a term. Prerequisite, admission to Honors program. One hour a week, to be arranged. Messrs. HOARD, JOHNSON, and LONG.

Informal presentation and discussion of selected topics in which all members of the seminar participate.

603-604. *HONORS RESEARCH*. Throughout the year. Credit one to four hours a term. Prerequisite, admission to Honors program and consent of staff member who supervises research. Hours to be arranged. STAFF.

Individual research on advanced problems in chemistry under the guidance of a staff member. A written report on the research results is required.

## THE CLASSICS

Mr. FRIEDRICH SOLMSEN, *Chairman*; Messrs. CHARLES L. BABCOCK, HARRY CAPLAN, JAMES HUTTON, GORDON M. KIRKWOOD, FREDERICK O. WAAGE.

*Those whose major study is in the Classics must complete twenty hours of advanced courses in the Department (Greek courses numbered above 201 or Latin courses numbered above 205), and fifteen hours, selected after conference with the adviser, in related subjects. Related subjects for this purpose are Ancient History, Modern Foreign Languages and Literatures, particularly French and German, Ancient Philosophy, Fine Arts 301, 302, 801, courses 201-202, 207-208, 214, 218, and 401 in Literature, and Linguistics 201-202, 281-282, and 283.*

*Students whose major study is in the Classics with an emphasis on Latin must include in their program before graduation Latin 205-206, 315-316, and 317-318.*

*Those whose major study is in Classical Civilization must complete (a) eighteen hours in Latin or Greek; (b) courses 201-202, and 207 in Literature, and nine further*

hours selected from the courses listed below under *Classical Civilization*; and (c) fifteen hours in related subjects. Related subjects for this purpose may be any courses in the Humanities, but selected in conference with the adviser so as to form a coherent and significant experience in the relation between antiquity and subsequent periods in the Western tradition; they may include courses listed under *Classical Civilization* which have not been used to satisfy requirement (b).

Candidates for the degree of Bachelor of Arts with Honors in Classics or with Honors in *Classical Civilization* must fulfill the requirements of the appropriate major study, as prescribed in the foregoing paragraphs, and must also complete successfully the special Honors courses 370, 371, and 372. Part of the credit for Honors courses may be included in the twenty hours required for the major study. Students who wish to become candidates for Honors, and who have a cumulative average of 80 or better should consult some member of the Department before preregistering for the second term of the junior year. Since Honors work in Classics is largely informal, the candidate will be responsible to a member of the Department who will be designated as his Honors adviser.

Informal study may be arranged for students who have a special interest and are able to work in areas not covered by the courses.

## GREEK

\*101. *GREEK FOR BEGINNERS*. Either term. Credit three hours. M W F 12. Fall term, Mr. HUTTON; spring term, Mr. CAPLAN. Introduction to Homer's *Iliad*.

\*103. *HOMER'S ILIAD*. Either term. Credit three hours. Prerequisite, Greek 101. M W F 12. Fall term, Mr. BABCOCK; spring term, Mr. SOLMSEN. Continuation of Greek 101.

\*201. *ATTIC GREEK*. Either term. Credit three hours. Prerequisite, Greek 103. Fall term, M W F 9, Mr. KIRKWOOD. Spring term, M W F 12, Mr. BABCOCK. Xenophon, *Anabasis*; Plato, *Apology*.

\*203. *EURIPIDES, IPHIGENIA IN TAURIS, AND ALCESTIS; NEW TESTAMENT, SELECTIONS*. Either term. Credit three hours. Prerequisite, Greek 201. T Th S 10. Fall term, Mr. SOLMSEN; spring term, Mr. ———.

209-210. *GREEK COMPOSITION*. Throughout the year. Credit one hour a term. Prerequisite, Greek 103 or the equivalent. T 2. Fall term, Mr. KIRKWOOD; spring term, Mr. ———.

301-302. *ARISTOPHANES, CLOUDS; SOPHOCLES, OEDIPUS REX; HERODOTUS*. Throughout the year. Credit three hours a term. Prerequisite, Greek 203. T Th S 10. Fall term, Mr. HUTTON; spring term, Mr. SOLMSEN.

305-306. *LYRIC POETRY; AESCHYLUS, PROMETHEUS BOUND; THUCYDIDES; DEMOSTHENES, PHILIPPIC ORATIONS*. Throughout the year. Credit three hours a term. Prerequisite, Greek 301-302. T Th S 10. Mr. ———.

309-310. *ADVANCED GREEK COMPOSITION*. Throughout the year. Credit one hour a term. Prerequisite, Greek 209-210 or the equivalent. W 2. Mr. HUTTON.

381-382. *SEMINAR: DEMOSTHENES*. Throughout the year. Credit three hours a term. For graduate students. T 2-4. Mr. CAPLAN.

[*GREEK DIALECTS*. Credit two hours. For graduate students. Not offered in 1956-1957.]

## LATIN

\*105-106. *LATIN FOR BEGINNERS*. Throughout the year. Credit three hours a term, M W F 12. Fall term, Mr. KIRKWOOD. Spring term, Mr. ———.



\*107-108. *FRESHMAN COURSE: SELECTIONS FROM CICERO AND VIRGIL.* Throughout the year. Credit three hours a term. Prerequisite, Latin 106 or two units of entrance Latin. T Th S 9. Mr. BABCOCK.

Primarily designed for students who have had two years of Latin in school. For the sake of those whose study of Latin has been interrupted, a considerable amount of review will be included in the work of the first term.

\*109. *FRESHMAN COURSE: VIRGIL AND OVID.* Fall term. Credit three hours. For students offering three units of entrance Latin. M W F 11. Mr. SOLMSEN. For the second term of Latin 109, see Latin 112.

\*111. *FRESHMAN COURSE: CICERO, DE SENECTUTE; MARTIAL, EPIGRAMS.* Fall term. Credit three hours. For students offering four units of entrance Latin. M W F 11. Mr. CAPLAN.

\*112. *FRESHMAN COURSE: HORACE, ODES AND EPODES.* Spring term. Credit three hours. Prerequisite, Latin 109 or 111, or the equivalent. M W F 11. Mr. HUTTON.

205-206. *TERENCE, ANDRIA; CATULLUS; HORACE, SATIRES AND EPISTLES; VIRGIL, GEORGICS; LIVY.* Throughout the year. Credit three hours a term. Prerequisite, Latin 112. Students may be admitted from Latin 108 with the consent of the instructor. M W F 10. Fall term, Mr. KIRKWOOD; spring term, Mr. BABCOCK.

221-222. *LATIN COMPOSITION.* Throughout the year. Credit one hour a term. Prerequisite, Latin 108 or 112. W 2. Mr. ———.

315-316. *THE GREATER REPUBLICAN WRITERS: PLAUTUS, CICERO, LUCRETIUS.* Throughout the year. Credit three hours a term. Prerequisite, Latin 205-206. M W F 9. Fall term, Mr. BABCOCK; spring term, Mr. CAPLAN.

[317-318. *LITERATURE OF THE EARLY EMPIRE: TACITUS, ANNALS; JUVENAL; PLINY'S LETTERS; SENECA'S LETTERS.* Throughout the year. Credit three hours a term. Prerequisite, Latin 205-206. Not offered in 1956-1957.]

321-322. *LATIN COMPOSITION. ADVANCED COURSE.* Throughout the year. Credit one hour a term. For undergraduates who have completed Latin 221-222 and for graduate students. M 2. Mr. BABCOCK.

[347. *HISTORY OF THE LATIN LANGUAGE.* Fall term. Credit two hours. For upperclassmen and graduate students. Not offered in 1956-1957.]

[350. *COMPARATIVE GRAMMAR OF GREEK AND LATIN.* Credit two hours. For upperclassmen and graduate students. Not offered in 1956-1957.]

369. *MEDIEVAL LATIN LITERATURE.* Either term. Credit three hours. Prerequisite, three years of high school Latin or the equivalent. Mr. CAPLAN.

381-382. *SEMINAR.* Throughout the year. Credit three hours a term. For graduate students. Th 2-4. Mr. ———.

[390. *ITALIC DIALECTS.* Credit two hours. For graduate students. Not offered in 1956-1957.]

060. *INFORMAL STUDY.* For qualified majors.

## HONORS COURSES

370. *HONORS COURSE.* Spring term. Credit three hours. To be taken in the junior year.

A program of readings and conferences centered in an author or a topic to be announced before the beginning of the term.



371. *HONORS COURSE*. Fall term. Credit three hours. To be taken in the senior year.

Continuation of 370, with change of author or topic.

372. *HONORS COURSE: SENIOR ESSAY*. Spring term. Credit three hours. For students who have successfully completed 371. Topics must be approved by the Honors adviser at the end of the first term of the senior year.

## CLASSICAL CIVILIZATION

[408. *CLASSICAL RHETORIC AND ORATORY*. Credit three hours. Primarily for graduate students. Not offered in 1956-1957.]

[410. *LATIN AND GREEK ELEMENTS OF THE ENGLISH LANGUAGE*. Credit two hours. Not offered in 1956-1957.]

*ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS*. (See Literature 201-202.)

*FOUNDATIONS OF WESTERN THOUGHT*. (See Literature 207.)

*EARLY CHRISTIAN LITERATURE AND ITS HELLENIC BACKGROUND*. (See Literature 208.)

*HUMANISM AND THE RENAISSANCE*. (See Literature 214.)

*PRINCIPLES OF LITERARY CRITICISM*. (See Literature 401-402.)

*CLASSIC MYTHS*. (See Literature 218.)

*OUTLINES OF ANCIENT HISTORY*. (See History 101, 102.)

[*GREEK HISTORY*. (See History 211.) Not offered in 1956-1957.]

[*THE HELLENISTIC AGE*. (See History 212.) Not offered in 1956-1957.]

*THE ROMAN REPUBLIC*. (See History 213.)

*THE ROMAN EMPIRE*. (See History 214.)

*INTRODUCTION TO ART*. (See Fine Arts 101-102.)

[*GREEK SCULPTURE*. (See Fine Arts 301.) Not offered in 1956-1957.]

[*ART OF THE ROMAN EMPIRE*. (See Fine Arts 302.) Not offered in 1956-1957.]

*ARCHAEOLOGY*. (See Fine Arts 801.)

*HISTORY OF PHILOSOPHY*. (See Philosophy 301.)

*ARISTOTLE*. (See Philosophy 575.)

## ECONOMICS

Mr. G. P. ADAMS, Jr., *Chairman*; Messrs. M. G. CLARK, M. A. COPELAND, D. F. DOWD, F. H. GOLAY, J. G. B. HUTCHINS, A. E. KAHN, M. S. KENDRICK, R. E. MONTGOMERY, CHANDLER MORSE, P. M. O'LEARY, E. J. RICE.

For a major in Economics the following courses must be completed: (1) Economics 103 and 104, or the equivalent; and twenty-four hours of advanced courses, including Economics 901; (2) in related subjects, fifteen advanced hours in not more than three of the following departments: Far Eastern Studies 201-202, Geology 105 and 108, Government, History, Mathematics, Philosophy, Psychology, and Sociology. Approved advanced courses in the field of Statistics may also be counted in satisfaction of the requirement in related subjects.

No course may be offered as a related subject which is counted in satisfaction of the common studies requirements.

*Students who intend to register in Arts and Sciences and in the Law School will be required to complete fifteen hours of advanced courses in Economics, including Economics 901, and six hours of related courses.*

*Students whose work in the College and particularly in the courses comprising their major has been of high quality may be permitted to enroll in informal study in Economics (090) in their senior year.*

*Candidates for the degree of Bachelor of Arts with Honors in Economics will enroll in the Honors seminar and will be expected to complete a minimum of fifteen additional hours of advanced courses in Economics, including Economics 901.*

*Students seeking admission to the Honors program should consult their advisers not later than May 1 of their junior year. Applications will not normally be considered from students whose cumulative average is less than 80 in both their general studies and their courses in Economics.*

*Students admitted to the Honors program will preregister for the Honors seminar not later than the spring term of their junior year and will be expected to prepare themselves in advance for discussion of the topic selected for the seminar in which they register.*

*A comprehensive Honors examination, both written and oral, will be given to Honors candidates at the end of their senior year, but those candidates will be exempted from final examinations in their other courses in Economics.*

\*103. *MODERN ECONOMIC SOCIETY.* Either term. Credit three hours. Open to a limited number of freshmen. Fall term, M W F 8, 9, 12, 2 or 3; T Th S 8, 9, 11. Spring term, M W F 8, 9; T Th S 9. Mr. DOWD and assistants.

A survey of the existing economic order, its more salient and basic characteristics, and its operations.

\*104. *MODERN ECONOMIC SOCIETY.* Either term. Credit three hours. Prerequisite, Economics 103. Fall term, M W F 8, 9; T Th S 9. Spring term, M W F 8, 9, 12, 2 or 3; T Th S 8, 9, 11. Mr. DOWD and assistants.

A continuation of Economics 103.

## MONEY, BANKING, AND TRADE FLUCTUATIONS

203. *MONEY AND BANKING.* Fall term. Credit three hours. Prerequisite, Economics 104. M W F 11. Mr. RICE.

A study of the monetary system of the United States with emphasis on the roles played by the commercial and central banks; included is a survey of monetary theory and the influence of credit and monetary measures on economic stability.

[204. *MONETARY THEORY AND PUBLIC POLICY.* Spring term. Credit three hours. Prerequisite, Economics 203. M W F 11. Mr. RICE.

A further study of monetary theory with emphasis on implications for monetary and fiscal policies; a consideration of international monetary relationships and some proposals for monetary reform. Not offered in 1956-1957.]

220. *TRADE FLUCTUATIONS.* Spring term. Credit three hours. Prerequisite, Economics 203. T Th S 10. Mr. RICE.

A study of the causes and effects of trade recessions and revivals, with an introduction to the methods of business forecasting. There will be intermittent discussions of current economic trends.

## ACCOUNTING AND STATISTICS

*PRINCIPLES OF ACCOUNTING* (Business and Public Administration 110). Fall term. Credit three hours. Examinations as necessary, T W or Th 7-9 p.m. Mr. SHANNON.

Analytical development of principles and procedures underlying financial statements—the accounting cycle. Primary emphasis is directed to the analysis of business transactions and the financial information afforded thereby.

*ADMINISTRATIVE ACCOUNTING* (Business and Public Administration 111). Spring term. Credit three hours. Prerequisite B. & P. A. 110. Hours to be arranged. Messrs. THOMAS and \_\_\_\_\_.

Accounting for financial and operational control—financial statement analysis, budgeting, statistical devices, and internal reports; special procedures for corporations and multi-unit enterprises; job order, process and standard cost procedures; managerial accounting problems—inventory valuation, sunk costs; introduction to fund accounting for governments; manufacturing cases.

*ADVANCED ACCOUNTING* (Business and Public Administration 112). Fall term. Credit three hours. Prerequisite, B. & P.A. 111. Limited to seniors. Consult the instructor before registering. Hours to be arranged. Mr. THOMAS.

Problems of income determination and allocation; the admission, valuation and presentation of each typical asset and equity element in a balance sheet and the related revenue and expense aspects; analysis and interpretation of financial statements according to varying philosophies; special topics—sinking funds, special reserves, and operating schedules.

*ADVANCED ACCOUNTING* (Business and Public Administration 113). Spring term. Credit three hours. Prerequisite, Business and Public Administration 112. Limited to seniors. Consult the instructor before registering. Hours to be arranged. Mr. THOMAS.

Problems of a partnership; consignments; branch accounting; consolidated statements; foreign exchange; estate and trust accounting; accounting for governmental and institutional units; reorganization and liquidation statements.

*STATISTICS* (Industrial and Labor Relations 210). Either term. Credit three hours. Two lectures and one two-hour laboratory. T Th 11 and a laboratory to be arranged. Mr. \_\_\_\_\_.

An introduction to the basic concepts of statistics; description of frequency distributions (averages, dispersion, and simple correlation), and introduction to statistical inference. This course is prerequisite to certain of the specialized courses on applications of statistics offered in various departments.

*ECONOMIC AND SOCIAL STATISTICS* (Industrial and Labor Relations 211). Either term. Credit three hours. Prerequisite I. & L.R. 210 or the equivalent. Two lectures and one two-hour laboratory. T Th 12 and a laboratory to be arranged. Mr. \_\_\_\_\_.

Application of statistical techniques to the quantitative aspects of the social sciences and of industrial and labor relations. Topics illustrative of the material to be covered are: construction and use of index numbers, time series analysis, elements of the design of sample surveys, and a brief introduction to the use of punch card equipment.

[309. *NATIONAL INCOME AND WEALTH*. Fall term. Credit three hours. Prerequisite, Economics 106 or the equivalent. M W F 2. Mr. COPELAND.

An examination of the commoner statistical measurements of general economic

activity and financial structure, and an appraisal of their significance for current business analysis and economic planning. Not offered in 1956-1957.]

*For additional courses in Statistics, see page 141.*

## ORGANIZATION AND CONTROL OF INDUSTRY

311. **CORPORATION FINANCE.** Spring term. Credit three hours. Prerequisite, B. & P.A. 110 or its equivalent. M W F 9. Mr. RICE.

A study of the financial practices of business corporations in the United States; types of corporate securities; sources of capital funds; determination and administration of corporate incomes; financial difficulties and corporate reorganizations; the relation of corporate practices to the functioning of the American economic system; and the regulatory activities of the Securities and Exchange Commission.

321. **PRIVATE ENTERPRISE AND PUBLIC POLICY.** Fall term. Credit three hours. Prerequisite, Economics 104. M W F 9. Mr. KAHN.

The approach to public policy in a private-enterprise system, in the light of the economist's concepts of competition and monopoly. An analysis and appraisal of the various real and fancied sources of monopoly in the American economy, with particular emphasis on our system of business organization, its price, production, and marketing policies.

322. **PUBLIC REGULATION OF BUSINESS.** Spring term. Credit three hours. Prerequisite, Economics 321 or consent of the instructor. M W F 9. Mr. KAHN.

A continuation of Economics 321, concentrating mainly on public policies of enforcing, supplementing, or replacing competition, with specific studies of selected industries and recent legal cases.

**TRANSPORTATION** (B. & P.A. 180). Fall term. Credit three hours. Limited to seniors who have taken Economics 104 or the equivalent. M W F 10. Mr. HUTCHINS.

A study of American transportation from the points of view of carriers, shippers, and public authorities. The emphasis is on the economics and practices of rate making, especially of railroads. Among the most important topics covered are: rates and the location of industry; national traffic flows; theory of rates; classification of freight; rate systems; commodity rate structures; new types of rates; rate divisions, rate bureaus, and other intercarrier relations; the development of regulation; the determination of the general level of rates; reasonableness of particular rates; the long and short haul clause. Lectures, cases, and discussions.

**TRANSPORTATION** (Business and Public Administration 181). Credit three hours. Limited to seniors who have taken B. & P.A. 180. M W F 10. Mr. HUTCHINS.

A continuation of B. & P.A. 180. New construction and abandonment; new equipment; railroad operations and service; policy problems; railroad finance and its regulation; consolidation; motor carrier transportation, operations and rate structures; tramp shipping, including charters and charter rates; ocean liner services, rates and conferences; merchant marine policy; port and terminal facilities; some aspects of air transportation and air policy.

## LABOR ECONOMICS

401. **LABOR CONDITIONS, ECONOMICS, AND PROBLEMS.** Fall term. Credit three hours. Prerequisite, Economics 104 or the equivalent. M W F 10. Mr. MONTGOMERY.

An introduction to labor economics and a survey of the more basic labor problems growing out of modern economic arrangements.

402. *TRADE UNIONISM AND COLLECTIVE BARGAINING*. Spring term. Credit three hours. Prerequisite, Economics 401 or consent of the instructor. M W F 10. Mr. MONTGOMERY.

A study of the origins, philosophic basis, aims, and policies of trade unions, of the economic implications of trade unionism in modern economic life, and of collective bargaining in selected industries.

411. *LEGAL AND CONSTITUTIONAL ASPECTS OF LABOR PROBLEMS*. Fall term. Credit two hours. Consult the instructor before registering. T 2-4. Mr. MONTGOMERY.

A study of the legal aspects of trade union objectives and methods and an examination of state-labor relationships. Among the topics treated: legal theories underlying labor law; statutory enactments affecting trade unions; injunctions, damage suits, criminal prosecutions, restrictions upon employers; conciliation, arbitration, mediation; and various types of labor legislation.

[412. *LEGAL AND CONSTITUTIONAL ASPECTS OF LABOR PROBLEMS*. Spring term. Credit two hours. Consult the instructor before registering. T 2-4. Mr. MONTGOMERY.

A continuation of Economics 411, with emphasis on social legislation and social insurance. Not offered in 1956-1957.]

420. *SELECTED PROBLEMS IN LABOR ECONOMICS*. Fall term. Credit one hour. Consult the instructor before registering. W 2-3. Mr. MONTGOMERY.

An undergraduate seminar in some of the problems of labor economics. Among the topics covered are problems consequent upon the spread of collective bargaining in different sectors of the economy; theoretical aspects of wage-price-costs relations; functional trends in the American labor movement; approaches of different writers and schools of thought; problems of the government's relation to labor.

421. *SELECTED PROBLEMS IN LABOR ECONOMICS*. Spring term. Credit one hour. Consult the instructor before registering. W 2-3. Mr. MONTGOMERY.

A continuation of Economics 420.

## PUBLIC FINANCE

*TAXATION* (Agricultural Economics 138). Fall term. Credit three hours. Open to upperclassmen who have taken Economics 104 or the equivalent. M W F 11. Mr. KENDRICK.

A study of the principles and practices of public finance, with emphasis on taxation. Among the topics examined are the growth of public expenditures and its causes; historical changes over time in sources of revenue; and property, inheritance, business, and personal income taxation.

502. *FEDERAL PUBLIC FINANCE*. Spring term. Credit three hours. M W F 11. Mr. KENDRICK.

An examination of national problems of taxation, expenditures, public debt, and fiscal policy.

## ECONOMIC AND BUSINESS HISTORY

601. *AMERICAN ECONOMIC HISTORY*. Fall term. Credit three hours. Open to upperclassmen, or with consent of the instructor. M W F 10. Mr. DOWD.

An examination and analysis of significant processes and relationships in the economic development of the United States from the colonial period to the present.

602. *ECONOMIC HISTORY OF EUROPE*. Spring term. Credit three hours. Open to upperclassmen with some background in Economics or History, or with consent of the instructor. M W F 10. Mr. DOWD.



An examination and analysis of significant processes and relationships in the economic development of Europe from the medieval period to the present. Attention will be given to reciprocal relationships between the social and political context and the behavior of the economy over time.

*DEVELOPMENT OF THE AMERICAN ECONOMY AND BUSINESS ENTERPRISE* (Business and Public Administration 120). Fall term. Credit three hours. Limited to seniors who have taken Economics 104. M W F 9. Mr. HUTCHINS.

A study of the development of significant features of the modern economy and of modern business. Attention is particularly focused on the period between 1790 and 1890. European developments of significance to the United States are discussed. Against the general economic background careful study is given to selected case studies illustrating business organization, policy, and practice of the time. The features and concepts of public economic policy are studied, in part by the case method.

*RECENT ECONOMIC AND BUSINESS CHANGES* (Business and Public Administration 121). Spring term. Credit three hours. Limited to seniors who have taken Economics 104. M W F 9. Mr. HUTCHINS.

A continuation of B. & P.A. 120, covering the period since 1890, although that course is not a prerequisite. Dominant attention is centered on the rise of big business and on the resulting problems of monopoly, competition, discrimination, financing, management, and public regulation. Characteristic types of business promotion and management are discussed through the case method. Attention is also given to major factors of national economic strength, including power production, technological development, transportation facilities and policy, public and private finance, and foreign trade and investment.

## INTERNATIONAL ECONOMICS

[701-702. *INTERNATIONAL ECONOMIC DEVELOPMENT, THEORY, AND POLICY*. Throughout the year. Credit three hours each term. Prerequisite, Economics 104. Economics 701 or consent of the instructor prerequisite to 702. T Th S 11. Mr. MORSE.

The first term covers developments from precapitalist origins to 1914, together with basic theory and analysis. Topics include the growth of trade, theory of trade, tariffs, commercial policy, foreign exchange, and the balance of payments. In the second term, major trends and policies from 1914 to the present are studied. Capital movements, exchange depreciation and control, trade regulation, and international stabilization and development schemes receive special attention. Not offered in 1956-1957.]

705. *COMMERCIAL POLICY*. Fall term. Credit three hours. Prerequisite, Economics 701 or consent of the instructor. T Th S 11. Mr. GOLAY.

Theoretical analysis of policies which are used to regulate international trade and payments. Tariff policies, trade and exchange control, international commodity agreements, trade and payments agreements, international cartels, and economic imperialism are emphasized.

706. *INTERNATIONAL CAPITAL MOVEMENTS*. Spring term. Credit three hours. Prerequisite, Economics 701 or consent of the instructor. T Th S 11. Mr. GOLAY.

Development of the theory of international short-term capital movements and international investment. Historical survey of international investment, and appraisal of the contribution of international investment to economic growth.

801. *ECONOMIC SURVEY OF THE FAR EAST*. Fall term. Credit three hours. Prerequisite, Economics 104 or consent of the instructor. T Th S 9. Mr. GOLAY.



Survey of the economic resources and organization of Far Eastern economies. Analysis of problems arising out of demographic characteristics, deliberate economic development, economic nationalism, regionalism, and external economic relations of Far Eastern countries.

802. *ECONOMIC DEVELOPMENT OF THE FAR EAST*. Spring term. Credit three hours. Prerequisite, Economics 104 or consent of the instructor. T Th F 9. Mr. GOLAY.

Study of the problem of accelerating economic growth, with emphasis on the Far East. Analysis of the process of capital formation, the role of the state, and the role of external assistance in economic development. Emphasis is also given to non-economic aspects of cultural change and economic development.

*COMPARATIVE ECONOMIC SYSTEMS: SOVIET RUSSIA* (Industrial and Labor Relations 341). Fall term. Credit three hours. Prerequisite, Economics 104 or the equivalent, or consent of the instructor. M W F 2. Mr. CLARK.

A comparative analysis of the principles, structure, and performance of the economy of Soviet Russia. Special attention will be devoted to industry and labor.

## ECONOMIC THEORY

901. *INTERMEDIATE ECONOMIC THEORY*. Either term. Credit three hours. Not open to sophomores. Required in the junior or senior year of all students majoring in Economics. Prerequisite, Economics 104. M W F 2. Mr. ADAMS.

An analysis of the pricing processes in a free-enterprise economy under varying competitive conditions and their role in the allocation of resources and the functional distribution of the national income.

903-904. *HISTORY OF ECONOMIC THOUGHT*. Throughout the year. Credit three hours a term. Not open to freshmen or sophomores. M W F 8. Mr. ADAMS.

A survey of the development of economic ideas from the Mercantilists to Alfred Marshall. Primary emphasis will be given to the Classical tradition. Extensive library readings and written reports based upon them will be required.

911. *ECONOMICS OF DISSENT*. Spring term. Credit two hours. Open to upperclassmen with consent of the instructor. Th 2-4. Mr. MONTGOMERY.

A study of the literature of social protest; of unorthodox or dissenting economic doctrines; and the various types of economic organization that have been proposed or attempted, including the Utopias, Marxian Socialism, Collectivism, Anarchism, the Single Tax, Syndicalism, Guild Socialism, Fabian Socialism, and Communism.

[912. *ECONOMICS OF DISSENT*. Spring term. Credit two hours. Open to upperclassmen with consent of the instructor. Th 2-4. Mr. MONTGOMERY.

A continuation of Economics 911, with emphasis upon the structural characteristics and the pricing and resource-allocation problems of different types of economic organization. Not offered in 1956-1957.]

[920. *FULL EMPLOYMENT AND FREE ENTERPRISE*. Spring term. Credit three hours. Open to seniors majoring in economics, and to others with the consent of the instructor. M W F 2. Mr. COPELAND.

A study of the relations of labor overdemand and of the forms of unemployment to optimum employment and to the system of capitalism and free private enterprise. A critical examination of recent federal policies to promote optimum employment and of various optimum employment plans. Not offered in 1956-1957.]

## HONORS PROGRAM

950. *HONORS SEMINAR*. Fall term. Credit four hours. Required of all seniors who are candidates for honors. Hours to be arranged. Mr. KAHN and STAFF.

An intensive examination of a topic or problem that cuts across the major subdivisions of economics. The topic for 1956-1957 is "Economic Policy for the West."

951. *HONORS SEMINAR*. Spring term. Credit five hours. Required of all seniors who are candidates for honors. M 2-4. Mr. KAHN and STAFF.

A continuation of Economics 950, together with supervision of the writing of a research paper.

## GRADUATE SEMINARS

These are open to graduates and, with the consent of the instructor, to qualified seniors.

275-276. *MONETARY AND BUSINESS CYCLE THEORY*. Fall term. Credit three hours a term. Hours to be arranged. Mr. RICE.

*SEMINAR IN ECONOMIC STATISTICS* (Industrial and Labor Relations 610). Fall term. Credit three hours. Hours to be arranged. Mr. ———.

375-376. *PUBLIC CONTROL OF BUSINESS*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. KAHN.

380. *TRANSPORTATION*. Fall term. Credit three hours. Hours to be arranged. Mr. HUTCHINS.

475-476. *LABOR ECONOMICS*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. MONTGOMERY.

575. *PUBLIC FINANCE*. Spring term. Credit three hours. Hours to be arranged. Mr. KENDRICK.

675-676. *ECONOMIC HISTORY*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. DOWD.

775-776. *INTERNATIONAL ECONOMICS*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. GOLAY.

[780. *ECONOMICS OF DEVELOPMENT*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. MORSE. Not offered in 1955-1956.]

[785. *ECONOMIC PROBLEMS OF SOUTHEAST ASIA*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. GOLAY. Not offered in 1956-1957.]

[975-976. *ECONOMIC THEORY*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. COPELAND. Not offered in 1956-1957.]

981-982. *HISTORY OF ECONOMIC THOUGHT*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. ADAMS.

## ENGLISH

Mr. F. E. MINEKA, *Chairman*; Messrs. M. H. ABRAMS, H. S. ADAMS, R. M. ADAMS, Mrs. M. BOYNTON, Messrs. R. BRUSTEIN, A. CAPUTI, G. F. CRONKHITE, R. A. DONOVAN, C. R. EDWARDS, R. H. ELIAS, Miss R. M. FISHER, Messrs. E. G. FOGEL, W. H. FRENCH, J. HANNESSON, CARL HARTMAN, B. HATHAWAY, G. H. HEALEY, Mrs. A. KAMINSKY, Messrs. W. R. KEAST, L. LANE, JR., R. W. LANGBAUM, J. G. LINN, J. A. MAZZEO, A. M. MIZENER,

D. MORRISON, Miss K. MUNZER, Messrs. D. NOVARR, B. R. PARK, S. M. PARRISH, E. B. PARTRIDGE, P. M. PILLSBURY, E. L. RUHE, W. M. SALE, JR., J. SENIOR, W. SLATOFF, W. D. SNODGRASS, H. W. THOMPSON.

*For major work in English a student is required to complete: (1) English 251-252, normally to be taken in the sophomore year; (2) twenty-four hours of upperclass courses in English; and (3) fifteen hours in related subjects. Eighteen of the twenty-four hours of upperclass courses must consist of three 400-level courses, each preceded by a different prerequisite at the 300-level. The remaining six of the twenty-four hours are open to election from all upperclass courses and from Literature 211-212, 301-302, 401-402. Selection of the twenty-four hours of English and the fifteen hours of related subjects, aimed at a reasonable distribution of courses within a unified field of interest, shall be undertaken in cooperation with the major adviser. Courses taken to satisfy college distribution requirements will not be accepted in satisfaction of the related-course requirement.*

*Courses numbered below 300 are introductory and are intended for underclassmen. All other courses are strictly limited to upperclassmen, except that students who have exempted any part of English 111-112 may in their fourth term enter one course numbered between 300 and 399. Students exempting English 112 may, in the second term of their freshman year, register in English 201, 203, 222, or 251.*

*Seminars for Honors candidates are open to those admitted to the Honors program (see p. 23).*

*Students who wish to elect a supplementary sequence in courses in writing may choose eighteen hours from English 201-202, 203-204, 385-386, 388, and 395-396.*

*Prospective teachers of English in secondary schools must elect a special sequence of related courses and should consult the Chairman of the Department, preferably during the second term of their freshman year, before making out their program for the sophomore year.*

**\*111-112. INTRODUCTORY COURSES IN READING AND WRITING.** Throughout the year. Credit three hours a term. Open to freshmen. English 111 is prerequisite to 112. M W F 8, 9, 10, 11, 12, 2; T Th S 8, 9, 10, 11, 12. Mr. NOVARR and others.

The aim of this course is to increase the student's ability to communicate his own thought and to understand the thought of others.

#### ENGLISH FOR FOREIGNERS.

*The following two courses are offered by the Division of Modern Languages. Foreign students should consult a member of that division in Morrill Hall 108.*

**\*102. ENGLISH FOR FOREIGNERS.** Fall term. Credit six hours. Prerequisite, placement by the instructor. Hours to be arranged.

**\*211. ENGLISH FOR FOREIGNERS.** Fall term. Credit six hours. Prerequisite, a satisfactory proficiency examination. Hours to be arranged.

#### COURSES PRIMARILY FOR SOPHOMORES

**201. PROSE AND COMPOSITION.** Either term. Credit three hours. Prerequisite, English 111 and 112 or the equivalent. Fall term, M W F 9, 10. Spring term, M W F 9, 10. Mr. FRENCH and others.

Exposition, with special attention to writing essays and reports; the paragraph; the outline; reading and analyzing expository prose; frequent practice in writing; personal conferences.

**202. PROSE AND COMPOSITION.** Spring term. Credit three hours. Prerequisite, English 201 or 203. T Th S 9. Mr. LANE.

Exposition, especially as developed through narrative and descriptive techniques; the sentence; the word; study of modern prose style; personal conferences.

203. *SPECIAL FORMS OF WRITING*. Either term. Credit three hours. Prerequisite, English 111-112 or the equivalent. Fall term, M W 12 or T Th 10, and an hour to be arranged. Spring term, T Th 12 and an hour to be arranged. Mr. HARTMAN.

Practice in writing verse and the short story.

204. *SPECIAL FORMS OF WRITING*. Spring term. Credit three hours. Prerequisite, English 203 or consent of the instructor. M W 12 or T Th 10, and an hour to be arranged. Mr. HARTMAN.

A continuation of English 203: practice in writing verse and the short story.

\*221. *INTRODUCTION TO POETRY*. Fall term. Credit three hours. Open to freshmen. M W F 10. Mr. HATHAWAY.

Selected English and American poems. A course intended to develop the understanding and enjoyment of poetry. May not be counted in satisfaction of the requirements for a major in English.

\*222. *INTRODUCTION TO FICTION*. Spring term. Credit three hours. Open to Freshmen. M W F 10. Mr.——.

A course intended to develop the understanding and enjoyment of the short story and novel. May not be counted in satisfaction of the requirements for a major in English.

251. *GREAT ENGLISH WRITERS*. Either term. Credit three hours. Fall term, T Th 11 and discussion sections to be arranged. Mr. ABRAMS and STAFF. Spring term, T Th S 12. Mr. HEALEY.

Studies in selected works of great English writers, Chaucer to the eighteenth century. Open to all students who have completed the requirement in English composition; those who have any intention of majoring in English should take this course and English 252 in the sophomore year.

252. *GREAT ENGLISH WRITERS*. Either term. Credit three hours. Prerequisite, English 251. Fall term, T Th S 12. Mr. HEALEY. Spring term, T Th 11 and discussion sections to be arranged. Mr. ABRAMS and STAFF.

Studies in selected works of great English writers of the nineteenth and twentieth centuries.

## COURSES FOR UPPERCLASSMEN

309. *THE SIXTEENTH CENTURY*. Fall term. Credit three hours. M W F 9. Mr. PARTRIDGE.

A study of English Renaissance prose and poetry with special emphasis on Wyatt, Surrey, Sidney, Spenser, Marlowe, Shakespeare, Nashe, and Bacon: lyric, pastoral, and heroic poetry; essays, criticism, and prose fiction.

310. *THE SEVENTEENTH CENTURY*. Spring term. Credit three hours. M W F 9. Mr. NOVARR.

The main traditions in poetry and prose from Donne to Dryden. An introduction to the metaphysical poets and the Sons of Ben; characters, emblems and broadside ballads; the King James Bible; Robert Burton, Sir Thomas Browne, Bunyan, Pepys, and others.

313. *THE EIGHTEENTH CENTURY*. Fall term. Credit three hours. T Th S 10. Mr. ABRAMS.

Major writers from Pope to William Blake; the relation of this literature to the thought and the other arts of the time.

317. *THE ROMANTIC PERIOD*. Fall term. Credit three hours. T Th S 9. Mr. PARRISH.

The nature of Romanticism, arrived at through a reading of the major poets: Wordsworth, Coleridge, Byron, Shelley, and Keats.

322. *THE VICTORIAN PERIOD*. Spring term. Credit three hours. T Th S 11. Mr. MINEKA.

The major poets and prose writers from Carlyle to Bernard Shaw, in relation to the thought of the time and to developments in the twentieth century.

325. *TWENTIETH-CENTURY LITERATURE*. Fall term. Credit three hours. M W F 2. Mr. MIZENER.

English and American literature since World War I. The material is dealt with historically, with special emphasis on such writers as Yeats, Eliot, Auden and Thomas, Joyce, Virginia Woolf, Hemingway and Faulkner. Reports.

329-330. *AMERICAN LITERATURE*. Throughout the year. Credit three hours a term. Open to sophomores with instructor's consent. M W F 9. Mr. ———.

Fall term: Revolution to the Civil War. Spring term: 1865 to the present.

336. *THE MODERN AMERICAN NOVEL*. Fall term. Credit three hours. M W F 10. Mr. SALE (will not be offered in 1957-1958.)

A critical study of American fiction, beginning with Howells and James and concluding with selected contemporary novels.

[338. *THE MODERN ENGLISH NOVEL*. Spring term. Credit three hours. M W F 10. Mr. SALE. (Will be offered in 1957-1958.)]

341. *REPRESENTATIVE ENGLISH DRAMAS*. Fall term. Credit three hours. M W F 10. Mr. LINN.

Stress will be placed on the major periods of the English drama.

*DRAMA AND THE THEATRE*. (See Literature 301-302.)

[349. *RECENT AMERICAN POETRY*. Fall term. Credit three hours. M W F 12. Mr. FRENCH. (Will be offered in 1957-1958.)]

355. *AMERICAN FOLK-LITERATURE*. Fall term. Credit three hours. T Th S 10. Mr. THOMPSON. Numbers limited; juniors and seniors only, plus a few graduate students. Before preregistration, students must see Mr. Thompson or his secretary in Goldwin Smith 178.

Backgrounds of American literature and life in traditional ballads, tales, proverbs, place-names, epitaphs, games, customs, and folk-science. Emphasis upon folk-songs, but no technical knowledge of music is required.

356. *BALLAD AND FOLKTALE*. Spring term. Credit three hours. T Th S 10. Mr. THOMPSON. Numbers limited; juniors and seniors only, plus a few graduate students. Before preregistration, students must see Mr. Thompson or his secretary in Goldwin Smith 178.

Study of Child's *English and Scottish Popular Ballads* (one-volume edition) and of an anthology of folktales (mostly European).

365. *CHAUCEER'S EARLY WORKS*. Fall term. Credit three hours. M W F 12. Mr. FRENCH. (Will not be offered in 1957-1958.)

Chaucer's life, contemporaries, minor poems, *Troilus and Criseyde*, and Prologue to *The Canterbury Tales*.

366. *CHAUCEER'S CANTERBURY TALES*. Spring term. Credit three hours. M W F 12. Mr. FRENCH.

A primarily literary study; brief reports; reading in writings about the fourteenth century.

369. *SHAKESPEARE*. Fall term. Credit three hours. M W F 11. Mr. KEAST.

An introduction to the works of Shakespeare, based on a selection of plays representative of the stages of his artistic development and the range of his achievement.

[373. *MILTON*. Fall term. Credit three hours. Prerequisite, English 251-252. T Th S 9. Mr. R. M. ADAMS. (Will be offered in 1957-1958.)]

382. *THE ENGLISH LANGUAGE*. Spring term. Credit three hours. T Th S 12. Mr. FRENCH.

Problems of language: origin, derivation, semantics, usage, and other topics studied historically.

385-386. *NARRATIVE WRITING*. Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor; ordinarily 202 or 204 will be prerequisite. T Th 11 and conferences to be arranged. Mr. HATHAWAY.

A course in the writing of fiction; study of models; analysis of students' work.

388. *VERSE WRITING*. Spring term. Credit three hours. Prerequisite, consent of the instructor. T Th 2-3:30. Mr. HATHAWAY. (Will not be offered in 1957-1958.)

The technique of poetry; study of models; criticism of students' poems; personal conferences.

395-396. *SEMINAR IN WRITING*. Throughout the year. Credit three hours each term. Prerequisite, English 385-386 or 388 or consent of the instructor. W 2-4. Mr. HATHAWAY.

For advanced writing students, who should be prepared to work out during the year a writing project in verse, narrative, or essay as part of a process of their development. Exploration of principles of literary theory pertinent to projects undertaken.

405-406. *OLD ENGLISH PROSE AND POETRY*. Throughout the year. Credit three hours a term. T Th S 11. Mr. FRENCH.

Philology and literature from the Anglo-Saxon invasion to the Norman conquest. Most of *Beowulf* will be read in the second term. This course is recommended by the Department to all who intend to become graduate students in English.

*SURVEY OF MEDIEVAL LITERATURE*. (See Literature 211-212.)

414. *RESTORATION LITERATURE*. Spring term. Credit three hours. M W F 10. Prerequisite, English 310, 313, or 373. Mr. KEAST. (Will not be offered in 1957-1958.)

Centering on Dryden's work in criticism, satire, drama, reflective verse, and the lyric, this course will attempt to trace the major shifts in ideas, conventions, and literary forms during the second half of the seventeenth century.

[416. *SEVENTEENTH-CENTURY POETRY*. Spring term. Credit three hours. M W F 10. Prerequisite, English 309, 310, or 373. Mr. R. M. ADAMS. (Will be offered in 1957-1958.)]

417. *THE ENGLISH NOVEL FROM DEFOE TO SCOTT*. Spring term. Credit three hours. M W F 9. Prerequisite, English 313, 336, or 338. Mr. ———. (Will not be offered in 1957-1958.)

The novels of Defoe, Richardson, Fielding, Smollet, Sterne, Goldsmith, Walpole, Austen, Scott, and others.

418. *MASTERWORKS OF THE ROMANTIC PERIOD*. Spring term. Credit three hours. T Th S 10. Prerequisite, English 313 or 317. Mr. ABRAMS.

A critical study of major romantic achievements in various forms: Blake's *The Book of Thel*, Wordsworth's *Prelude*, Shelley's *Prometheus Unbound*, Byron's *Don Juan*, Keats' *Odes*, Emily Brontë's *Wuthering Heights*.

419. *ELIZABETHAN AND JACOBAN DRAMA*. Fall term. Credit three hours. Prerequisite, English 309, 310, 341, or 369. T Th S 10. Mr. NOVARR.



Critical study of plays by Marlowe, Marston, Jonson, Webster, Beaumont, Fletcher, Ford, and others. The development of dramatic forms and the main currents of ideas in dramatic representation by contemporaries of Shakespeare and Donne.

421. *BROWNING, DICKENS, AND ARNOLD*. Fall term. Prerequisite, English 317 or 322. Credit three hours. T Th S 11. Mr. MINEKA. Three major Victorian writers of poetry, fiction, and criticism.

439. *ENGLISH AND AMERICAN NOVELISTS*. Fall term. Credit three hours. Prerequisite, English 336 or 338 and the consent of the instructor. M W F 12. Mr. SALE.

In 1955-56 the emphasis will be placed about equally upon the novels of Conrad and novels comparable to Conrad's in such matters as theme or technique.

470. *SHAKESPEARE*. Spring term. Credit three hours. Prerequisite, English 341 or 369. M W F 11. Mr. MIZENER.

An intensive study of three or four of Shakespeare's plays.

[476. *STUDIES IN EARLY AMERICAN AUTHORS*. Spring term. Credit three hours. T Th S 9. Prerequisite, English 329. Mr. CRONKHITE. (Will be offered in 1957-1958.)

The work of such authors as Jonathan Edwards, Franklin, Paine, Freneau, C. B. Brown, Irving, Bryant, and Cooper studied in relationship to Puritanism, Deism, and the beginnings of the Romantic movement.]

[478. *EMERSON, THOREAU, AND WHITMAN*. Fall term. Credit three hours. M W F 10. Mr. THOMPSON. Prerequisite, English 329. (Will be offered in 1957-1958.)]

479. *POE, HAWTHORNE, AND MELVILLE*. Fall term. Credit three hours. Prerequisite, English 329. M W F 10. Mr. THOMPSON. (Will not be offered in 1957-1958.)

A critical study of three major American writers of fiction, with emphasis upon their achievement of artistic form.

481. *MARK TWAIN, HOWELLS, AND JAMES*. Spring term. Credit three hours. Prerequisite, English 329, 330, or 336. T Th S 9. Mr. ———. (Will not be offered in 1957-1958.)

A critical study of three major American writers with special attention to their techniques and their common endeavor to portray the American character.

485. *STUDIES IN TWENTIETH-CENTURY WRITERS*. Spring term. Credit three hours. M W F 2. Prerequisite, English 325. Mr. R. M. ADAMS.

A critical examination of significant recent writers and movements in England and in the United States. Topic for 1956-1957: the impact of Freud on modern literature; studies in Joyce, Eliot, Kafka, Thomas, and Strindberg, in conjunction with selected readings in Freud, Jung, and Bodkin.

*PRINCIPLES OF LITERARY CRITICISM*. (See Literature 401-402.)

## SEMINARS FOR HONORS CANDIDATES

*Students may be candidates for Honors by gaining admission to Honors seminars. The senior seminars are taken in addition to the twenty-four hours required of all majors. The Honors candidates are required to take one Honors seminar in the spring term of the junior year, and one each term of their senior year. Comprehensive examinations for all candidates for Honors will be given at the end of the senior year.*

*Junior Seminars in Literature. Two seminars will be offered in the spring term. Applications for admission to these seminars should be filed at the office of the De-*

partment not later than November 2; the necessary forms may be obtained from the secretary of the Department. Applicants will be interviewed by Mr. Mizener before preregistration. Those accepted will become provisional candidates for the degree with Honors.

390. *APPROACHES TO LITERATURE*. Spring term. Credit three hours. Prerequisite, acceptance as a provisional candidate for honors. M 2-4, Mr. ABRAMS. W 2-4, Mr. R. M. ADAMS.

Works of literature from various periods, studied from the point of view of biography, the history of ideas and traditions, social history, and the analysis of a work in itself.

*Senior Seminars in Literature*. Two seminars will be offered, one in each term. Candidates will be selected from the junior seminars. Other students whose work in English has been of high quality may apply and will be considered if there are openings. Such students should apply not later than April 15 of their junior year.

491. *THE CRITICISM OF POETRY*. Fall term. Credit three hours. T 2-4. Mr. MIZENER.

Critical problems in the study of diverse poetic kinds and traditions.

492. *THE CRITICISM OF FICTION*. Spring term. Credit three hours. T 2-4. Mr. KEAST.

The insights made possible by the examination of the shorter forms of fiction from various points of view.

## COURSES FOR GRADUATE STUDENTS

*These are seminars normally open only to graduate students; exceptions may be made to admit undergraduates only with the consent of the instructor. Not all of these courses can be offered, but persons interested in particular courses should address inquiries to the Department of English. If enough students apply, a course will usually be given. Consent of the instructor is required of all graduate students for registration in any course offered by the Department.*

501. *BIBLIOGRAPHY AND METHOD*. Fall term. Credit three hours. Th 2-4. Mr. HEALEY. Recommended for all candidates for the doctorate.

503-504. *MIDDLE ENGLISH LITERATURE*. Fall and spring terms. Credit three hours. M 2-4. Mr. FRENCH.

505. *MEDIEVAL LITERATURE*. Spring term. Credit three hours. T Th 2-4. Mr. MAZZEO.

507. *ELIZABETHAN LITERATURE*. Spring term. Credit three hours. W 4-6. Mr. KEAST.

510. *SEVENTEENTH-CENTURY LITERATURE*. Spring term. Credit three hours. T 2-4. Mr. NOVARR.

514. *EIGHTEENTH-CENTURY LITERATURE*. Spring term. Credit three hours. Th 4-6. Mr. KEAST.

515. *THE ROMANTIC PERIOD*. Fall term. Credit three hours. T 2-4. Mr. ABRAMS.

535-536. *VICTORIAN LITERATURE*. Fall and spring terms. Credit three hours. W 2-4. Mr. MINEKA.

541-542. *AMERICAN LITERATURE*. Fall and spring terms. Credit three hours. M 2-4. Fall term. Mr. ———; spring term, Mr. THOMPSON.

546. *PROSE FICTION*. Fall term. Credit three hours. Th 2-4. Mr. SALE.

551-552. *DRAMATIC LITERATURE*. Fall and spring terms. Credit three hours. M 2-4. Mr. ———.

556. *TWENTIETH-CENTURY LITERATURE*. Spring term. Credit three hours. T 4-6. Mr. MIZENER.

557-558. *SEMINAR IN WRITING*. Fall and spring terms. Credit three hours. W 2-4. Mr. HATHAWAY.

## FAR EASTERN STUDIES

Mr. JOHN M. ECHOLS, *Chairman*; Mr. KNIGHT BIGGERSTAFF, Miss GUSSIE E. GASKILL, Messrs. FRANK H. GOLAY, CHARLES F. HOCKETT, R. B. JONES, GEORGE McT. KAHIN, EDWARD E. LeCLAIR, MORRIS E. OPLER, N. ALLEN PATTILLO, HAROLD SHADICK, LAURISTON SHARP, ROBERT J. SMITH.

*The Far Eastern Studies major must demonstrate proficiency in a Far Eastern language and complete the following: Far Eastern Studies 201-202 and 951-952; twenty-one additional hours selected from the courses listed below; two one-year courses in one of the following fields: Anthropology, Government, Economics, History, Linguistics, Literature, Philosophy, or Sociology (one of these must be an advanced course, and neither may be a course listed under Far Eastern Studies); and a comprehensive examination at the end of the senior year. To be admitted to the major a student must have completed one of the courses listed below and be recommended by the professor in charge of that course.*

*Candidates for the Bachelor of Arts with Honors in Far Eastern Studies must include Far Eastern Studies 901 among the twenty-one hours stipulated in the preceding paragraph. Applicants to the Honors program must have a cumulative grade average of 80 or above.*

## FAR EAST, GENERAL

201. *INTRODUCTION TO THE CONTEMPORARY FAR EAST: CHINA AND NORTHEAST ASIA*. Fall term. Credit three hours. M W F 9. Messrs. BIGGERSTAFF, SMITH, and others.

Introduction to the land, the people, and the social, political, and economic life and organization of China, Japan, and Korea, together with some consideration of the Soviet Far East. Attention is given to the modernization of these countries, to their external relations, and to contemporary conditions and events.

202. *INTRODUCTION TO THE CONTEMPORARY FAR EAST: SOUTHEAST ASIA AND INDIA*. Spring term. Credit three hours. M W F 9. Messrs. OPLER, KAHIN, and others.

Introduction to the land, the people, and the modern social, political, and economic life of Burma, Ceylon, India, Indochina, Indonesia, Malaya, Pakistan, the Philippines, and Thailand. Attention is given to the native culture base, to the background of colonialism or dependence from which this politically awakened region has emerged, and to the problems of modernization now faced by the peoples of the area.

*GEOGRAPHY OF ASIA*. Spring term. M W F 8. Mr. MULLER. (See Geology 206.)

*GOVERNMENT AND POLITICS OF ASIA*. Spring term. M W F 10. Mr. KAHIN. (See Government 314.)

*FAR EASTERN POLICY OF THE UNITED STATES*. Fall term. M W F 10. Mr. KAHIN. (See Government 417.)

*SEMINAR: POLITICAL PROBLEMS OF ASIA*. Throughout the year. Hours to be arranged. Mr. KAHIN. (See Government 395-6.)

*ECONOMICS OF THE FAR EAST.* Throughout the year. T Th S 9. Mr. GOLAY. (See Economics 801, 802.)

*NATIVE CULTURES OF ASIA AND THE PACIFIC: SOUTH ASIA AND OCEANIA.* Fall term. M W F 2. Mr. SHARP. (See Sociology and Anthropology 605.)

*NATIVE CULTURES OF ASIA AND THE PACIFIC: EAST ASIA.* Spring term. M W F 2. Mr. SMITH. (See Sociology and Anthropology 606.)

[*SEMINAR: CULTURE AND CULTURE CHANGE IN JAPAN.* Mr. SMITH. (See Sociology and Anthropology 686.) Not offered in 1956-1957.]

*INTRODUCTION TO FAR EASTERN ART.* Mr. PATTILLO. Fall term. W 3-5. (See Fine Arts 602.)

901. *HONORS COURSE.* Fall term. Credit three hours. Time to be arranged.

This course, in which the student writes an Honors essay, is required of all Honors students in their senior year. It is taken with the student's major adviser.

951. *SEMINAR IN FAR EASTERN STUDIES.* Fall term. Credit two hours. Prerequisite, consent of the Department. T 2-4. STAFF.

This is the basic seminar for graduate students minoring in Far Eastern Studies, and it is also required of undergraduate Far Eastern Studies majors in their senior year. Students are taught bibliography and the techniques of library research, familiarized with the contributions of the different disciplines to Far Eastern area research, and given practical experience in research and reporting on important problems common to some or all Far Eastern countries.

952. *DIRECTED READING IN FAR EASTERN STUDIES.* Spring term. Credit two hours. Open only to undergraduate Far Eastern Studies majors in their senior year. Hours to be arranged. MAJOR ADVISERS.

## CHINA

*ELEMENTARY CHINESE.* T Th 9, daily at 8. Mr. HOCKETT. (See Chinese 101-102.)

*INTRODUCTION TO CLASSICAL CHINESE.* M W F 11. Mr. SHADICK. (See Chinese 201-202.)

*INTERMEDIATE CHINESE.* T Th S 11. Mr. SHADICK. (See Chinese 203-204.)

*THE LINGUISTIC STRUCTURE OF CHINESE.* Spring term. Mr. HOCKETT. (See Chinese 232.)

*READINGS IN CHINESE LITERATURE: CLASSICAL AND MODERN.* Mr. SHADICK. (See Chinese 351-352.)

*CHINESE LITERATURE IN TRANSLATION: PHILOSOPHICAL AND HISTORICAL LITERATURE.* Fall term. M W F 10. Mr. SHADICK. (See Literature 321.)

*CHINESE LITERATURE IN TRANSLATION: IMAGINATIVE LITERATURE.* Spring term. M W F 10. Mr. SHADICK. (See Literature 322.)

375-376. *SEMINAR IN CHINESE LITERATURE.* Hours and credit to be arranged. Mr. SHADICK.

*HISTORY OF CHINESE CIVILIZATION: TO 1842.* Fall term. M W F 12. Mr. BIGGERSTAFF. (See History 161.)

*HISTORY OF CHINESE CIVILIZATION: SINCE 1842.* Spring term. M W F 12. Mr. BIGGERSTAFF. (See History 162.)

*MODERNIZATION OF CHINA: 1842-1911.* Fall term. M 3-5. Mr. BIGGERSTAFF. (See History 811.)

*MODERNIZATION OF CHINA: SINCE 1911.* Spring term. M 3-5. Mr. BIGGERSTAFF. (See History 812.)

*SEMINAR IN MODERN CHINESE HISTORY.* Mr. BIGGERSTAFF. (See History 875-876.)

## INDIA

*ELEMENTARY HINDI.* T Th 2 and daily at 10. Mr. ———. (See Hindi 101-102.)

*HINDI READING.* Hours to be arranged. Mr. ———. (See Hindi 201-202.)

*ELEMENTARY SANSKRIT.* Fall term. Mr. FAIRBANKS. (See Linguistics 283.)

501-502. *INDIA.* Throughout the year. Credit three hours a term. F 4-6. Limited to graduate students except with special permission of the staff. Messrs. OPLER, LECLAIR, and others.

A graduate-level survey of the culture and history of India from the earliest times to the present, but with particular emphasis on recent developments and contemporary problems.

[*SEMINAR: CULTURE AND CULTURE CHANGE IN INDIA.* Mr. OPLER. (See Sociology and Anthropology 683.) Not offered in 1956-1957.]

995-996. *INDIA RESEARCH TRAINING SEMINAR.* Credit and hours to be arranged. Under this title are listed the special seminars offered by visiting professors.

997-998. *SEMINAR: FIELD RESEARCH IN INDIA.* Prerequisite: consent of instructor. Mr. SINGH.

A research seminar conducted in India for a limited number of advanced students.

## SOUTHEAST ASIA

*ELEMENTARY BURMESE.* Mr. JONES. (See Burmese 101-102.)

*ELEMENTARY INDONESIAN.* Mr. ECHOLS. (See Indonesian 101-102.)

*INDONESIAN READING.* Mr. ECHOLS. (See Indonesian 201-202.)

*INDONESIAN COMPOSITION AND CONVERSATION.* Mr. ECHOLS. (See Indonesian 203-204.)

*ELEMENTARY THAI.* Mr. JONES. (See Thai 101-102.)

*ELEMENTARY VIETNAMESE.* Mr. JONES. (See Vietnamese 101-102.)

*CHINESE DIALECTS OF SOUTHEAST ASIA.* Mr. HOCKETT. (See Chinese 231.)

*SOUTHEAST ASIAN LITERATURE IN TRANSLATION.* Spring term. T 2-4. Mr. ECHOLS. (See Literature 319.)

601-602. *SOUTHEAST ASIA.* Throughout the year. Credit three hours a term. Messrs. KAHIN, SHARP, ECHOLS, GOLAY, and others.

A graduate-level survey of the cultures and history of Southeast Asia covering the pre-European, colonial, and postcolonial periods, but with particular emphasis on postwar developments and contemporary problems.

*SEMINAR: POLITICAL PROBLEMS OF SOUTHEAST ASIA.* Fall term. Hours to be arranged. Mr. KAHIN. (See Government 395.)

*SEMINAR: ECONOMIC PROBLEMS OF SOUTHEAST ASIA.* Throughout the year. Hours to be arranged. Mr. GOLAY. (See Economics 785-786.)

[SEMINAR: SOUTHEAST ASIAN ANTHROPOLOGY. Mr. SHARP. (See Sociology and Anthropology 685.) Not offered in 1956-1957.]

975-976. SOUTHEAST ASIA RESEARCH TRAINING SEMINARS. Either term. Credit and hours to be arranged. Limited to graduate students. Prerequisite, consent of Department.

Grouped under this title are special seminars taught by visiting professors.

977-978. SEMINAR: FIELD RESEARCH IN SOUTHEAST ASIA. Prerequisite: consent of instructors. Mr. SHARP (in Thailand).

Research seminars conducted in the field for a limited number of advanced students.

## THE FINE ARTS

Mr. F. O. WAAGE, *Chairman*; Messrs. D. L. FINLAYSON, N. A. PATTILLO, ALAN R. SOLOMON, JAMES H. TURNURE.

*Students who wish to do their major work in the Fine Arts will choose one of these two options:*

1. GENERAL COURSE. In this option the following courses must be completed:

(1) *Aesthetics*, six hours, namely, *Psychology 101* and *Philosophy 230*.

(2) (a) *Music*, nine hours, including *Music 101-102*.

(b) *Visual Arts*, nine hours, including *Fine Arts 101-102*.

(c) *Literature*, nine hours, including *Literature 101-102* or *301-302*.

(3) Fifteen hours of approved advanced courses forming a logically coherent group within one of three fields: (a) *Literature* (literary history, criticism, writing, dramatics); (b) *Visual Arts* (history, practice); (c) *Music* (theory, composition, application).

2. VISUAL ARTS COURSE. In this option a student is required to complete (1) *Fine Arts 101-102, 111-112*; (2) eighteen hours of other courses in *Fine Arts*; and (3) fifteen hours in related subjects, including *Psychology 101, Philosophy 230, and History 103-104* or *105-106* or the year course in either *Ancient, Medieval, or Modern History*. Students electing this option are encouraged, but not required, to elect courses in the practice of art given in the *College of Architecture* (see the Announcement of that College). A student, however, who, wishing to do graduate work in the practice of art, intends to qualify for admission to the Graduate School as a candidate for the M.F.A. degree, should elect thirty hours of such courses in the practice of art.

Applicants for the degree of Bachelor of Arts with Honors in Fine Arts should apply at the departmental office during the first week in October of their junior year. In order to be eligible for the Honors program, the candidate must have elected the *Visual Arts* option as his major subject, have cumulative averages of 80 for all courses in the College, and 85 for courses in the Department of Fine Arts. The candidate is required to complete *Fine Arts 951-952* and *955-956*, submit a senior thesis, and pass a senior comprehensive examination. Further information in regard to the Honors program may be obtained at the departmental office, Goldwin Smith 39.

## GENERAL COURSES

\*101-102. INTRODUCTION TO ART: PAINTING AND SCULPTURE. Throughout the year. Credit three hours a term. *Fine Arts 101* is prerequisite to *Fine Arts 102*. (For a course covering the same material as *Fine Arts 102* but without prerequisite, see *Fine Arts 104*.) Open to all students. M W F 12. Messrs. WAAGE and TURNURE.



A survey of the pictorial and sculptural styles and major monuments of our own culture and of those ancestral to it. The course attempts to illustrate the evolution of Western civilization in terms of its visual arts by showing how art forms arise as a natural consequence of the character of each culture period.

\*104. *INTRODUCTION TO ART: PAINTING AND SCULPTURE FROM THE RENAISSANCE TO THE PRESENT.* (The material covered substantially duplicates that of Fine Arts 102.) Spring term. Credit three hours. Open to all students except those who have had Fine Arts 101 or 102. T Th S 9. Mr. PATTILLO.

A survey beginning with the fifteenth century and dealing chiefly with painting.

\*111-112. *INTRODUCTION TO ART: ARCHITECTURE.* Throughout the year. Credit three hours a term. Open to all students. T Th S 11. Mr. PATTILLO.

A survey of the architecture of the Western world from ancient times to the present. The first term ends with the Romanesque period; the second begins with the Gothic.

### PRIMITIVE AND PREHISTORIC

[204. *PRIMITIVE ART: THE ART OF EARLY SOCIETIES.* Spring term. Credit three hours. Open to sophomores who have had Fine Arts 101-102 and to upper-classmen without prerequisite. M W F 10. Mr. WAAGE. Not offered in 1956-1957.]

### ANCIENT AND MEDIEVAL

[301. *GREEK SCULPTURE.* Fall term. Credit three hours. Not open to freshmen. M W F 10. Mr. WAAGE. Not offered in 1956-1957.]

[302. *ART OF THE ROMAN EMPIRE.* Fall term. Credit three hours. Not open to freshmen. M W F 10. Mr. WAAGE. Not offered in 1956-1957.]

401. *MEDIEVAL ART.* Fall term. Credit three hours. Not open to freshmen. T Th S 10. Mr. TURNURE.

A general course in the representative arts of the Middle Ages beginning with the Early Christian period and extending through the Byzantine Empire in the east and to the fifteenth century in western Europe.

### RENAISSANCE AND MODERN

505. *ITALIAN PAINTING.* Fall term. Credit three hours. Not open to freshmen. T Th S 9. Mr. PATTILLO.

The Renaissance painting of Italy, chiefly of the Florentine and Venetian Schools. Among the major artists whose lives and works will be studied are Fra Angelico, Masaccio, Piero della Francesca, Botticelli, Leonardo, Michelangelo, Raphael, Correggio, Giovanni Bellini, Giorgione, Titian, and Tintoretto.

506. *RENAISSANCE AND MODERN SCULPTURE.* Spring term. Credit three hours. Not open to freshmen. W 3-5 with an occasional additional afternoon or evening hour to be arranged. Mr. PATTILLO.

A study of the main course of development of sculpture in Europe and America from fifteenth-century Italy to the present day, with emphasis in each period upon the works of a few representative artists.

551. *ANALYSIS OF WORKS OF ART.* Fall term. Credit three hours. Not open to freshmen. Registration limited to 75. T Th S 12. Mr. SOLOMON.

The study of selected examples of painting, sculpture, and architecture from various periods, with emphasis on the formal and iconographical problems. No previous experience in the fine arts is expected. Class discussions.

554. *TWENTIETH-CENTURY PAINTING*. Spring term. Credit three hours. Not open to freshmen and sophomores. Registration limited to 150. T Th S 12. Mr. SOLOMON.

Major tendencies in modern art from Cézanne to the present will be considered in the course. The lectures will cover such key figures as Cézanne, Matisse, Picasso, and Klee in great detail. The development will also be correlated with contemporary trends in sculpture and architecture.

### FAR EASTERN

[601. *INTRODUCTION TO FAR EASTERN ART*. Fall term. Credit three hours. Not open to freshmen. W 3-5 with an occasional additional afternoon or evening hour to be arranged. Mr. PATTILLO. Not offered in 1956-1957.]

602. *INTRODUCTION TO FAR EASTERN ART*. Fall term. Credit three hours. Not open to freshmen. W 3-5 with an occasional additional afternoon or evening hour to be arranged. Mr. PATTILLO.

The art of China and Japan from the ancient Chinese bronzes to the nineteenth century.

### ARCHAEOLOGY

801-802. *ARCHAEOLOGY*. Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor. M 2-4:30. Mr. WAAGE.

Study of the techniques of archaeological excavation and of archaeological materials in the University's collections.

### SEMINARS AND HONORS COURSES

[940. *SEMINAR IN ART HISTORY: PICASSO AND RELATED MOVEMENTS*. Fall term. Credit three hours. Prerequisite, Fine Arts 554 or equivalent and consent of the instructor. Th 2:15-4:45. Mr. SOLOMON. Not offered in 1956-1957.]

941. *SEMINAR IN ART HISTORY: POST-IMPRESSIONIST PAINTING*. Fall term. Credit three hours. Prerequisite, Fine Arts 554 or equivalent and consent of the instructor. Th 2:15-4:45. Mr. SOLOMON.

The origins of modern art in the period between Cézanne and the Fauves. Cézanne, Seurat, Gauguin, van Gogh, and Toulouse-Lautrec will be considered. Discussion and individual reports.

[942. *SEMINAR IN ART HISTORY: ANTI-RATIONAL TENDENCIES IN TWENTIETH-CENTURY ART*. Fall term. Credit three hours. Prerequisite, Fine Arts 554 or equivalent and consent of the instructor. Th 2:15-4:45. Mr. SOLOMON. Not offered in 1956-1957.]

944. *SEMINAR IN ART HISTORY: GREAT MASTERS OF THE BAROQUE*. Spring term. Credit three hours. Not open to freshmen. Prerequisite, consent of the instructor. Th 2-4:30. Mr. TURNURE.

Major personalities in the art of the seventeenth century, including Rembrandt, Rubens, and Caravaggio. Individual reports.

951-952. *HONORS WORK*. Throughout the year. Credit three hours a term. Prerequisite, provisional acceptance as a candidate for Honors. Hours to be arranged.

Independent work; preparation of papers.

955-956. *HONORS WORK*. Throughout the year. Credit three hours a term. Prerequisite, Fine Arts 952. Hours to be arranged.

Preparation of a senior thesis.

## COURSES IN THE COLLEGE OF ARCHITECTURE

The following courses offered in the College of Architecture, but only these courses, may be counted in the ninety hours of Arts and Sciences courses:

*THE ARTS IN AMERICA* (Arch. 424, 425). Throughout the year. Credit three hours a term. Not open to freshmen. M W F 2. Mr. FINLAYSON.

*WEST EUROPEAN PAINTING* (Arch. 426, 427). Throughout the year. Credit three hours a term. Not open to freshmen. M W F 11. Mr. FINLAYSON.

## PRACTICE OF ART

*For courses in the practice of art which may be elected by students in the College of Arts and Sciences, see the Announcement of the College of Architecture; these courses may not be counted in the ninety required hours of Arts courses.*

## GEOLOGY AND GEOGRAPHY

Mr. W. S. COLE, *Chairman*; Messrs. A. L. ANDERSON, J. D. BURFOOT, JR., R. A. CHRISTMAN, E. H. MULLER, C. M. NEVIN, J. W. WELLS.

*For a major in Geology the following courses must be completed: (1) in Geology, courses 101-102, 207, 208, 209, 301, 303, 401, 601, 602, 901 and one-hour informal study in one of the divisions of the Department in the second semester of the senior year; (2) in related subjects, Mathematics 133 and 161-162 or 181-182; General Chemistry 105-106; Introductory Physics 107-108; Engineering Drawing; and Plane Surveying. The following elective courses outside the Department are recommended: Mathematics 163 or 183, English 201-202, Public Speaking 101 and either 202 or 205, Statistics, Qualitative Analysis, Quantitative Analysis, Physical Chemistry, Advanced Physics, and Invertebrate Zoology.*

## COURSES WITHOUT PREREQUISITES

*These courses are open to freshmen, and others, without prerequisite.*

\*101-102. *GENERAL GEOLOGY*. Throughout the year; cannot be begun in the spring term. Credit three hours a term (if taken after Geology 115, two hours a term). Satisfies the science requirements of the College of Arts and Sciences. Intended for underclassmen. May also be taken as a terminal course by upperclassmen who have satisfied the science requirement in the biological sciences. Lectures, T Th 11, or M W 10. Laboratory, M T W Th or F 2-4:30. Mr. COLE, Mr. WELLS.

The course comprises an introduction to the various branches of geologic science: mineralogic, lithologic, geomorphic, structural, glacial, historic, and economic. The purpose of the course is to provide an adequate base for those who will major in geology and a comprehensive survey of earth science for the general student.

\*105. *GENERAL GEOGRAPHY*. Fall term. Credit three hours. M W F 9. Mr. MULLER.

An introduction to geography including space relationships, world climates, soils, and geographic provinces. Land use, the natural resources of selected regions, and trade in these resources will be emphasized.

\*108. *MINERAL RESOURCES*. Spring term. Credit three hours. Intended as a background course for all undergraduates interested in mineral resources for economics, history, government, industry and labor relations, etc. M W F 9. Mr. ANDERSON.

A geographic, cultural study of the nature, utilization, occurrence, distribution,

production, consumption, reserves, and political and commercial control of the world's important mineral resources.

\*111. *ANCIENT LIFE*. Spring term. Credit three hours. No prerequisite but may well be preceded by Geology 101-102 or Geology 115. M W F 11. Mr. WELLS.

A cultural course devoted to a review of the fossil remains of life in the geologic periods as indicative of the continuity of organic evolution. Attention given chiefly to vertebrate forms from fish to man. For major students in Geology the course is a supplement to Geology 601-602.

113. *ENGINEERING GEOLOGY*. Either term. Credit three hours only. Students who have had Geology 101-102 or 115 may take 113 for one hour credit. Lectures: fall term, M W 11; spring term, T Th 9. Laboratory, M W or T Th 2-4:30. Mr. ANDERSON.

The purpose of the course is to provide a geologic background so that the engineer will be competent to adapt his work to conform with the limitations imposed by geologic conditions.

\*115. *ELEMENTARY GEOLOGY*. Either term. Credit three hours. Intended for underclassmen in Agriculture and those in Arts and Sciences who do not plan to major in geology. This course cannot be used to satisfy the science group requirement of the College of Arts and Sciences. Lectures, T Th 11. Laboratory, M T W Th or F 2-4:30, or S 8-10:30, or S 10:30-1. Mr. NEVIN.

The purpose of the course is to present the fundamental principles of geology with emphasis on the physical aspects.

## SECOND COURSES

201. *HISTORIC GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102 or Geology 115. Lectures, M W 9. Laboratory, W 2-4:30. Mr. WELLS.

Geologic history of the earth with special reference to North America. For geology majors and other students desiring a broad view of the physical and organic history of the earth.

[204. *GEOGRAPHY OF NORTH AMERICA*. Spring term. Credit three hours. Prerequisite, Geology 101-102 or Geology 105. M W F 8. Mr. MULLER. Alternate-year course; not offered in 1956-1957.]

206. *GEOGRAPHY OF ASIA*. Spring term. Credit three hours. Prerequisite, Geology 101-102 or Geology 105. M W F 8. Mr. MULLER. Alternate-year course; offered in 1956-1957.

The geographic provinces of Asia, their geomorphic expression, climates, resources, development, and interrelationships.

207-208. *MINERALOGY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 106. Fall term prerequisite to spring term. Fall term: lectures, M W 10; laboratory, F 2-4:30. Spring term: lecture, M 10; laboratories, T F 2-4:30. Mr. CHRISTMAN.

Fall term: crystallography and fundamentals for identifying minerals by their physical and chemical properties. Spring term: systematic mineralogy and introduction to lithology.

209. *LITHOLOGY*. Spring term. Credit three hours. Prerequisites, Geology 101-102 and 207-208. Lecture, M F 12. Laboratory, Th 2-4:30. Mr. CHRISTMAN.

The mineral composition, texture, classification, identification, modes of origin, and properties of igneous, sedimentary, and metamorphic rocks.

## STRUCTURAL GEOLOGY AND SEDIMENTATION

301. *STRUCTURAL GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. Lectures, M W 11. Laboratory, M 2-4:30. Mr. NEVIN.

The purpose of the course is to classify and analyze geologic structures with reference to their nature and origin and in regard to their use in the interpretation of geologic problems.

303. *SEDIMENTATION*. Spring term. Credit three hours. Prerequisite, Geology 101-102. Registration limited. For students who are majoring in geology and those interested in the engineering problems related to sedimentation. Lectures, M W 11. Laboratory, M 2-4:30. Mr. NEVIN.

A study of the accumulation and ordering of sediments, together with critical discussions of the problems these present.

[321. *PETROLEUM GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. For students who intend to enter the oil industry. Lectures, M W 9. Laboratory, W 2-4:30. Mr. NEVIN. Not offered in 1956-1957.]

391-392. *SEMINAR IN STRUCTURAL GEOLOGY AND SEDIMENTATION*. Throughout the year. Credit variable. For advanced students. M 4:45. Mr. NEVIN.

395-396. *ADVANCED OR SPECIAL WORK IN SEDIMENTATION, STRUCTURAL, AND PETROLEUM GEOLOGY*. Throughout the year. Credit variable. For advanced and graduate students in geology. Prerequisite, consent of the instructor. F 9-11:30. Mr. NEVIN.

Original investigations, essential to the further training of the student in geologic interpretations.

030. *INFORMAL STUDY*. Mr. NEVIN. See italicized statement, p. 67.

## GEOMORPHOLOGY AND GLACIAL GEOLOGY

401. *GEOMORPHOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. Lectures, T Th 9. Laboratory, T 2-4:30. Mr. MULLER.

Description and interpretation of land forms in terms of structure, process, and stage.

403. *GLACIERS AND THE PLEISTOCENE EPOCH*. Spring term. Credit three hours. Prerequisite, Geology 101-102. Lectures, T Th 9. Laboratory, T 2-4:30. Mr. MULLER.

Living glaciers and the phenomena of the glacial period.

495-496. *ADVANCED OR SPECIAL WORK IN GEOGRAPHY, GEOMORPHOLOGY, OR GLACIAL GEOLOGY*. Credit variable. Prerequisite, consent of the instructor. For advanced and graduate students. Days and hours to be arranged. Mr. MULLER.

040. *INFORMAL STUDY*. Mr. MULLER. See italicized statement, p. 67.

## MINERALOGY AND PETROLOGY

501. *OPTICAL MINERALOGY*. Fall term. Credit three hours. Prerequisite, Geology 207-208. Lecture, W 12. Laboratories, F 8-10:30 and S 10:30-1. Mr. CHRISTMAN.

The theory of optical properties of crystals and application to the determination and study of minerals with the petrographic microscope. The common rock-forming minerals are studied in fragments and thin sections.

502. *PETROLOGY*. Spring term. Credit three hours. Prerequisite, Geology 501; prerequisite or parallel, Geology 209. Lecture, W 9. Laboratories, F 8-10:30 and S 9-11:30. Mr. CHRISTMAN.

A study of the description, classification, and origin of igneous, metamorphic, and sedimentary rocks with the use of the petrographic microscope.

591-592. *SEMINAR IN MINERALOGY AND PETROLOGY*. Throughout the year. Credit one hour a term. Prerequisite, permission of instructor. W 4:45. Mr. CHRISTMAN and Mr. BURFOOT.

Literature, special topics, advanced methods. For all interested students; attendance expected of majors and minors in mineralogy and petrology.

595-596. *ADVANCED OR SPECIAL WORK IN MINERALOGY AND PETROLOGY*. Throughout the year. Credit variable. Prerequisites, variable. Days and hours to be arranged. Mr. BURFOOT and Mr. CHRISTMAN.

Adapted to the needs of the individual student. Advanced methods, special problems, research.

050. *INFORMAL STUDY*. Mr. CHRISTMAN. See italicized statement, p. 67.

## PALEONTOLOGY AND STRATIGRAPHY

601-602. *INVERTEBRATE PALEONTOLOGY*. Throughout the year. Credit three hours a term. Prerequisite, Geology 101-102 and, if possible, invertebrate zoology. For students who are majoring in geology and for students in biology interested in the fossil evidence of the development of organisms. Lectures, T Th 10. Laboratory: fall term, Th 2-4:30; spring term, W 2-4:30. Mr. COLE, Mr. WELLS.

Fall term: Paleobiology and classification of important fossil invertebrate organisms. Spring term: key fossils and faunas of the geologic periods.

605-606. *STRATIGRAPHY*. Throughout the year. Credit three hours a term. Prerequisites, Geology 101-102 and first term of 601-602. Lectures, T Th 9, and an hour to be arranged. Mr. COLE, Mr. WELLS.

The principles of stratigraphy, developed by detailed study of selected American and European systemic examples. Fall term: the Paleozoic. Spring term: the Mesozoic and Cenozoic.

675. *MICROPALAEONTOLOGY*. Spring term. Credit two hours. Prerequisite, consent of the instructor; preparation should include Geology 101-102, 201, 601-602, and 605. W 9 and hours to be arranged. Mr. COLE.

Microfossils, chiefly Foraminifera.

[681. *STRATIGRAPHY OF NEW YORK STATE*. Spring term. Credit two hours. Prerequisites, Geology 101-102, 605, or consent of the instructor. Lectures in winter months, all-day and week-end field trips in spring months. T Th 12. Mr. WELLS. Alternate year course; not offered in 1956-1957.]

695-696. *ADVANCED OR SPECIAL WORK IN PALEONTOLOGY AND STRATIGRAPHY*. Throughout the year. Credit variable. Prerequisite, Geology 601-602 and 605. Intended for upperclassmen majoring in geology, and graduates. Days and hours to be arranged. Mr. COLE, Mr. WELLS.

The purpose of the course is to provide for direction in the study of particular problems in paleontology and stratigraphy, adapted to the needs of the individual student.

060. *INFORMAL STUDY*. Mr. COLE, Mr. WELLS. See italicized statement, p. 67.



## ECONOMIC GEOLOGY

701-702. *GENERAL ECONOMIC GEOLOGY*. Throughout the year. Credit three hours a term. Prerequisites, Geology 102 or 113, and 208, or consent of the instructor. Geology 701 prerequisite to 702. For geology majors and those interested in the occurrence and origin of industrial source materials. Lectures, T Th 11. Laboratory, F 2-4:30. Mr. ANDERSON.

Genetic aspects of mineralization, principles and processes involved in formation of mineral deposits; nature, properties, modes of occurrence, distribution, and utilization of the important metalliferous and nonmetalliferous mineral substances. Field trips in the spring term.

712. *METALLURGICAL RAW MATERIALS*. Fall term. Credit three hours. For second-year students in metallurgical engineering. Lectures, M T Th 9. Mr. ANDERSON.

The properties, occurrence, associations, distribution, and economic aspects of the commercially important ore, refractory, and fluxing materials that enter metallurgical operations.

721. *ORE MICROSCOPY*. Fall term. Credit two hours. Prerequisite, Geology 207-208. F S 8-10:30. Mr. ANDERSON. Alternate year course; offered in 1956-1957.

Identification of ore minerals in polished sections with reflected light by means of etch and microchemical reactions, and study and interpretation of mineral relationships. Emphasis on paragenesis. The course is designed to serve as a tool in the genetic study of ore deposits.

732. *MINING GEOLOGY*. Spring term. Credit three hours. Prerequisite, Geology 701. Lectures M W F 8 or hours otherwise arranged. Mr. ANDERSON. Alternate year course; offered in 1956-1957.

Mapping, sampling, and evaluation techniques in the investigation of ore deposits, and geological principles of ore search and ore appraisal.

[775-776. *MINERAL DEPOSITS*. A two-term course. Credit three hours a term. Prerequisites, Geology 701 or equivalent. Lectures, M W F 8 or hours otherwise arranged. Mr. ANDERSON. Alternate year course; not offered in 1956-1957.]

791-792. *SEMINAR IN ECONOMIC GEOLOGY*. Throughout the year. Credit one hour a term. Registration by invitation of the instructor. For majors and minors in economic geology. T 4:45. Mr. ANDERSON.

Seminar designed to keep the student abreast of current advances in the field of economic geology.

795-796. *ADVANCED OR SPECIAL WORK IN ECONOMIC GEOLOGY*. Throughout the year. Credit variable. Prerequisites dependent on nature of the work, but Geology 208, 501, and 701-702 (or 721-722) are ordinarily required. Intended for graduate majors in economic geology. T 12. Mr. ANDERSON.

Work designed to meet the needs and training of the student. May include research in economic geology or guided study of advanced or special problems in economic geology.

070. *INFORMAL STUDY*. Mr. ANDERSON. See italicized statement, p. 67.

## FIELD COURSES

901. *GEOLOGIC MAPPING*. Given at the Summer Field Camp. Credit six hours. Mr. NEVIN.

Instruction in the fundamental methods used in geologic mapping, together with practical work in the field. For students majoring in geology. Special circular from the Department on request.

[912. *GEOLOGIC INTERPRETATION OF AERIAL PHOTOGRAPHS*. Fall term. Credit three hours. Prerequisite, Geology 301. For majors in geology. Lecture, M 12. Two laboratories by arrangement. Mr. WELLS. Alternate year course; not offered in 1956-1957.]

## GOVERNMENT

Mr. CLINTON ROSSITER, *Chairman*; Messrs. HERBERT W. BRIGGS, ROBERT E. CUSHMAN, ARCHIE T. DOTSON, MARIO EINAUDI, ANDREW HACKER, GEORGE MCT. KAHIN, H. MARK ROELOFS.

*For a major in Government the following courses must be completed: (1) Government 101 and Government 104; (2) twenty-four additional hours in the Department; (3) in related subjects, eighteen hours selected with the approval of the adviser from courses (other than the introductory courses) in Economics, Far Eastern Studies, History, Philosophy, Sociology and Anthropology, Business and Public Administration, Industrial and Labor Relations, and Regional Planning. Of the hours in related subjects, at least nine must be in History.*

Juniors and seniors majoring in the Department who have a grade of 85 or better in one half of the hours they have passed may take informal study in Government. Consent of the instructor is required.

Candidates for the degree of Bachelor of Arts with Honors in Government will complete Government 101 and 104, eighteen hours in related subjects, and will be expected to complete satisfactorily thirty additional hours of work in the Department, including Government 621-622 and Government 624. For the prerequisites and descriptions of these courses, see below. The purpose of the Honors program is to afford opportunity for comprehensive reading in the fields of government and to permit independent work in a field for which the student is qualified.

Students seeking admission to the Department's Honors program should file applications on forms obtainable from the departmental secretary by November 1 of their junior year. Applications should be submitted only by students having grades of 85 or better in at least half of all courses completed or who can present evidence of exceptional promise.

A comprehensive examination for Honors will be given to students admitted to the program at the end of their senior year.

Students registered in the combined Arts-Law course with a major in Government will be required to take (1) Government 101 and Government 104; (2) fifteen additional hours in the Department; (3) in related subjects, twelve hours.

## AMERICAN GOVERNMENT AND INSTITUTIONS

\*101. *AMERICAN GOVERNMENT*. Fall term. Credit three hours. Open to all students. Lectures, T Th 2. Discussion sections: Th 3, F 10, 11, 2, 3, S 10, 11. Mr. CUSHMAN, Mr. ROSSITER, and STAFF.

A general introduction to American national government and politics. Emphasis will be placed upon historical development, organization, powers, practical working, and problems of federalism.

202. *PROBLEMS IN AMERICAN STATE AND LOCAL GOVERNMENT*. Spring term. Credit three hours. Open to sophomores with consent of instructor, and to upperclassmen. Prerequisite, Government 101. M W F 12. Mr. DOTSON.

An intensive examination of selected issues in American state and local government. Such topics as interstate conflict and cooperation, federal-state-local regulations, forms of local government, metropolitan government, and proposals for regional government will be considered. Special attention will be given to theories of self-government. Wherever possible, current newspaper and case materials will be used.

212. *THE LEGISLATIVE PROCESS*. Spring term. Credit three hours. Open to sophomores and upperclassmen who have had Government 101. T Th S 11. Mr. HACKER.

The legislative process in the United States Congress; the origins and purposes of legislation; the role of lobbyists and pressure groups; committees and investigations; variations among Congressmen and constituencies. Comparisons with the "legislative process" in private organizations will be made.

216. *THE AMERICAN PRESIDENCY*. Spring term. Credit three hours. Open to sophomores and upperclassmen who have had Government 101. M W F 11. Mr. ROSSITER.

Analysis of the office and powers of the President, with emphasis on his functions as chief administrator, commander-in-chief, leader of legislation, political leader, and chief of foreign relations. The lives and accomplishments of the important Presidents are studied at length.

217. *AMERICAN POLITICAL PARTIES*. Fall term. Credit three hours. Open to sophomores and upperclassmen. Prerequisite, Government 101. T Th S 11. Mr. HACKER.

The efforts of Democrats, Republicans, and private organizations to secure public support. The roles of public opinion and the extent of public participation will be emphasized.

231. *INTRODUCTION TO PUBLIC ADMINISTRATION*. Fall term. Credit three hours. Open to sophomores and upperclassmen. Prerequisite, Government 101 or consent of instructor. M W F 12. Mr. DOTSON.

An introduction to American public administration. An elementary examination of key concepts in organization, administrative procedure, and human relations in cooperative activity. An extensive study of the national administrative establishment, including the Executive Office of the President, the departmental system, the regulatory commissions, the government corporations, the civil service, and the basic problems of these agencies.

234. *PUBLIC ADMINISTRATION AND PUBLIC POLICY*. Spring term. Credit three hours. Open to sophomores and upperclassmen. Prerequisite, Government 101 or consent of instructor. M W F 2. Mr. DOTSON.

A study of the role of the administrator in the formulation of public policy. An examination of the processes, problems, and effects of executive influence in legislation and adjudication. An effort at redefinition of democratic responsibility in the light of modern political requirements.

237. *THE ADMINISTRATIVE PROCESS*. Fall term. Credit three hours. Open to sophomores with consent of instructor and to upperclassmen. Prerequisite, Government 101 or consent of instructor. M W 2-3:30. Mr. DOTSON.

An examination of the law governing the administrative process. An investigation of elements of administrative law, the powers and procedures of and the limitations upon administrative officers and agencies. Case materials employed throughout the course.

[238. *PRINCIPLES AND PROBLEMS OF AMERICAN DEMOCRACY*. Spring term. Credit three hours. Open to upperclassmen. Prerequisite, Government 235 and consent of the instructor. Hours to be arranged. Mr. ROSSITER. Not offered in 1956-1957.]

241. *CONSTITUTIONAL LAW: THE AMERICAN FEDERAL SYSTEM*. Fall term. Credit three hours. Open to qualified juniors and seniors with consent of instructor. Prerequisite, Government 101. T Th S 11. Mr. CUSHMAN.

Judicial interpretation of the Constitution; the nature of the judicial review; separation of government powers; relations between state and national governments; construction of national powers.

242. *CONSTITUTIONAL LAW; FUNDAMENTAL RIGHTS AND IMMUNITIES*. Spring term. Credit three hours. Open to qualified juniors and seniors with consent of instructor. Prerequisite, Government 101. T Th S 11. Mr. CUSHMAN.

Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and the equal protection of the laws.

255. *THE SOCIAL BASIS OF AMERICAN POLITICAL INSTITUTIONS*. Fall term. Credit three hours. Open to sophomores and upperclassmen. Prerequisite, Government 212 or 217 or consent of instructor. T Th S 9. Mr. HACKER.

An examination of American social structure with reference to the ways in which social forces shape the institutions of government. Areas of study will include the economic system, class structure, religious organization, technological development, ethnic origins, military commitments, and regional variations.

256. *AMERICAN POLITICAL BEHAVIOR*. Spring term. Credit three hours. Open to sophomores and upperclassmen. Prerequisite, Government 212 or 217 or consent of instructor. T Th S 9. Mr. HACKER.

The factors which motivate political attitudes and behavior in individuals. Variations in personality characteristics and relative positions in the power structure will be stressed.

275-276. *SEMINAR IN CONSTITUTIONAL PROBLEMS*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. CUSHMAN.

285. *SEMINAR IN PROBLEMS OF PUBLIC ADMINISTRATION*. Fall term. Credit three hours. Open to graduate students and qualified seniors. Hours to be arranged. Mr. DOTSON.

295-296. *SEMINAR IN AMERICAN POLITICAL THEORY AND INSTITUTIONS*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. ROSSITER.

020. *INFORMAL STUDY*. Mr. HACKER. See italicized statement, page 72.

050. *INFORMAL STUDY*. Mr. ROSSITER. See italicized statement, page 72.

070. *INFORMAL STUDY*. Mr. DOTSON. See italicized statement, page 72.

090. *INFORMAL STUDY*. Mr. CUSHMAN. See italicized statement, page 72.

## COMPARATIVE GOVERNMENT

\*104. *COMPARATIVE GOVERNMENT*. Spring term. Credit three hours. Open to all students. Lectures, T Th 2. Discussion sections, Th 3, F 10, 11, 2, 3, S 10, 11. Mr. EINAUDI, Mr. ROELOFS, and STAFF.

A comparative study of major contemporary political currents and of governmental institutions and processes.

[311. *CONSTITUTIONAL GOVERNMENT IN EUROPE*. Fall term. Credit three hours. Prerequisite, Government 104. T Th 2-3:30. Mr. EINAUDI. Not offered in 1956-1957.]

313. *GOVERNMENT AND POLITICS OF GREAT BRITAIN AND THE COMMONWEALTH*. Fall term. Credit three hours. Prerequisite, Government 104. M W F 10. Mr. ROELOFS.

The constitutional traditions, the contemporary government institutions, and the

political and social structure of the United Kingdom. Some of the fundamental problems of the British Commonwealth of Nations will be discussed.

314. *GOVERNMENT AND POLITICS OF ASIA*. Spring term. Credit three hours. Open to sophomores and upperclassmen. M W F 10. Mr. KAHIN.

Description and analysis of political life and the structure and functioning of government in the principal countries of Asia, with attention being given to the nature of the social and economic environments which condition them.

331. *PUBLIC CONTROL OF ECONOMIC LIFE*. Fall term. Credit three hours. Open to upperclassmen. T Th 2-3:30. Mr. EINAUDI.

The development of the theory and practice of public controls in the twentieth century, examined with reference to the United States, Europe, and the Soviet sphere. A political analysis of planning and nationalization within the framework of constitutionalism and communism. The limitations imposed by constitutional democracy. The scope and method of totalitarian planning. Politics vs. economics. Nationalism vs. supranationalism.

[385-386. *SEMINAR IN COMPARATIVE CONSTITUTIONAL LAW*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. EINAUDI. Not offered in 1956-1957.]

395-396. *SEMINAR IN POLITICAL PROBLEMS OF ASIA*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. KAHIN.

## POLITICAL THEORY

235. *AMERICAN POLITICAL THOUGHT: THE FIRST THREE CENTURIES*. Fall term. Credit three hours. Open to upperclassmen. Prerequisite, Government 101 or History 151-152. T Th S 9. Mr. ROSSITER.

Survey of the development of American political thought, with emphasis on the interaction of history and ideas. The following schools and problems are studied at length: Puritanism, pre-Revolutionary democratic thought, the American Revolution, constitutionalism and federalism, Jeffersonian democracy, Jacksonian democracy, intellectual democracy, neo-federalism, slavery, the nature of the union, collectivism v. individualism. Other kinds of thought—constitutional, social, religious, economic, cultural—are considered in their relations to political thought.

236. *AMERICAN POLITICAL THOUGHT: TWENTIETH CENTURY*. Spring term. Credit three hours. Open to upperclassmen. Prerequisite, Government 235 or consent of instructor. M W F 2. Mr. ROSSITER.

An intensive study of the major categories of American political thought in the twentieth century, including conservatism, pseudo-conservatism, liberalism, radicalism, socialism, individualism, pragmatism, welfare capitalism, agrarianism.

321. *DEVELOPMENT OF MODERN POLITICAL THOUGHT*. Fall term. Credit three hours. Open to sophomores with consent of instructor and to upperclassmen. Lectures, T Th 10. Discussion sections, T 2, 3:30, W 2, 3:30. Mr. EINAUDI.

This course deals with the development of political thought from the later Middle Ages to the eighteenth century. It is built around certain essential concepts of political theory: the nature of law, the state and sovereignty, individual rights and the community. Particular attention will be given to Marsilius, Bodin, Hobbes, the Enlightenment, and Rousseau.

322. *CONTEMPORARY POLITICAL THOUGHT*. Spring term. Credit three hours. Prerequisite, Government 321 or consent of instructor. Lectures, T Th 10. Discussion sections, T 2, 3:30, W 2, 3:30. Mr. EINAUDI.



Political thought from the industrial revolution to the present. Special emphasis will be placed on the historical and theoretical development as well as on the current significance of Marxism.

324. *THEORY OF THE DEMOCRATIC STATE*. Spring term. Credit three hours. Prerequisite, Government 321 or consent of instructor. Lectures M W 10. Discussion sections, Th 10, F 10, 2. Mr. ROELOFS.

An analysis of Western democratic theory. The origins of modern democratic ideas in the works of such men as Aristotle, Aquinas, Luther, Adam Smith, and Paine will be reviewed, but the chief emphasis will be on the development of these ideas by modern English and American writers such as Green, Lindsay, Barker, Royce, Corwin, Dewey, and Becker.

375-376. *SEMINAR IN POLITICAL THEORY*. Throughout the year. Credit three hours. Open to graduate students and qualified seniors. Hours to be arranged. Mr. EINAUDI.

030. *INFORMAL STUDY*. Mr. ROELOFS. See italicized statement, p. 72.

060. *INFORMAL STUDY*. Mr. EINAUDI. See italicized statement, p. 72.

## INTERNATIONAL RELATIONS

411. *INTERNATIONAL POLITICS*. Fall term. Credit three hours. Open to sophomores and upperclassmen. M W F 9. Mr. BRIGGS.

A systematic study of patterns of international politics; the relevance and character of national power; the purposes, motivations, and methods of power politics; ethics, law, public opinion, and power as restraints on power; the changing face of nationalism; structural changes in the balance of power; the art of diplomacy and problems of power and peace in the mid-twentieth century.

414. *INTERNATIONAL ORGANIZATION*. Spring term. Credit three hours. Open to sophomores and upperclassmen. M W F 9. Mr. BRIGGS.

An analysis of international governmental procedures and institutions; international administration; international legislation; power politics and collective efforts to maintain international peace and security; the League of Nations; the United Nations and specialized agencies; the judicial function and the International Court of Justice.

417. *THE FAR EASTERN POLICY OF THE UNITED STATES*. Fall term. Credit three hours. Open to sophomores and upperclassmen. M W F 10. Mr. KAHIN.

An analysis of the relations of the United States with China, Japan, Korea, and Southeast Asia during the nineteenth and twentieth centuries; the relationship of American policy to the policies of the European powers in the area. (Approximately one-half of this course deals with the period since 1945.)

441-442. *INTERNATIONAL LAW*. Throughout the year. Credit three hours a term. Open to qualified upperclassmen. M W F 11. Mr. BRIGGS.

A systematic study of the nature, development, and judicial application of the principles of international law. Cases, readings, and discussions.

475-476. *SEMINAR IN INTERNATIONAL LAW AND INTERNATIONAL ORGANIZATION*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. BRIGGS.

040. *INFORMAL STUDY*. Mr. KAHIN. See italicized statement, p. 72.

080. *INFORMAL STUDY*. Mr. BRIGGS. See italicized statement, p. 72.



## HONORS PROGRAM

621-622. *SENIOR HONORS PROGRAM*. Throughout the year. Credit six hours in the fall term and three hours in the spring term. Prerequisite, admission to the Honors program. Hours to be arranged. MEMBERS OF THE DEPARTMENT.

Extensive reading in the fields of government and the preparation of papers in tutorial groups.

624. *SENIOR HONORS ESSAY*. Spring term. Credit three hours. MEMBERS OF THE DEPARTMENT.

Independent research project on a selected topic.

## HISTORY

Mr. PAUL W. GATES, *Chairman*; Messrs. KNIGHT BIGGERSTAFF, DAVID B. DAVIS, EDWARD W. FOX, HENRY GUERLAC, M. L. W. LAISTNER, FREDERICK G. MARCHAM, THEODOR E. MOMMEN, CURTIS P. NETTELS, DEXTER PERKINS, EUGENE F. RICE, WALTER M. SIMON, MARC SZEFTTEL.

*For a major in History the following courses must be completed: (1) in History, thirty hours, of which at least twelve must be in courses above the 100 level; (2) in related subjects, at least eighteen hours to be determined in consultation with the adviser. Of the hours in related subjects at least six must be in other than introductory courses.*

*Honors program: The Department of History offers a three-term sequence of instruction, for a total of nine credit hours, leading to the degree of B.A. with Honors in History. The purpose of the program is to offer an opportunity for unusually able students to work independently, but with suitable guidance, on a senior Honors essay, and to gain a systematic understanding of History as a discipline, by relieving them of a proportion of their course obligations. Honors candidates will take History 614 in the spring term of their junior year, and will enroll in History 615-616 throughout their senior year (see special section below headed "Honors Program"); and they are encouraged to elect History 429 during the fall term of their senior year. They may also, at the discretion of instructors, be admitted to graduate seminars during their senior year.*

*The minimum requirements for admission to candidacy for Honors include (a) a cumulative average of 80 in all academic courses; (b) a cumulative average of 85 in courses in the Humanities and Social Sciences; (c) enrollment and satisfactory performance in at least one course in History above the 100 level by the fall term of the junior year.*

*The criteria for the award of the degree with Honors include (a) maintenance of the averages named above; (b) completion of an Honors essay of high quality; (c) passing a comprehensive examination at the end of the senior year.*

*The program is supervised by a departmental committee consisting of Messrs. Guerlac (chairman), Rice, and Simon. Applications for candidacy in 1956-1957 should be made to Mr. Rice during the first two weeks in November.*

\*101-102. *ANCIENT HISTORY*. Throughout the year. Credit three hours a term. M W F 9. Mr. LAISTNER.

The work of the first term will include: (1) a brief survey of Stone and Bronze Age cultures in Europe and the Near East and of the early civilizations of Mesopotamia, Egypt, Asia Minor, and the Eastern Aegean; (2) a fuller treatment of the political, economic, and cultural history of the Greek world to 146 B.C. The second term will be devoted to the early history of the Rome and other Italian communities; the emergence of Rome as the chief power, first in Italy and then in the Western

Mediterranean; and, finally, the development and culture of the Roman Empire to the death of Constantine.

\*103-104. *DEVELOPMENT OF WESTERN CIVILIZATION*. Throughout the year. Credit three hours a term. Open to freshmen and sophomores who have not taken History 101-102, 105-106, or 107-108; to juniors and seniors by permission only. M W (F) 10, Mr. SIMON and assistants. T Th (S) 9, Mr. RICE and assistants. Sections to be arranged.

An introductory survey of European history since antiquity. Attention is given equally to the major political and social developments and to the intellectual heritage of the West. A considerable portion of the reading is in selections from the sources.

\*107-108. *ENGLISH HISTORY FROM ANGLO-SAXON TIMES TO THE PRESENT*. Fall and spring terms. Credit three hours a term. May be taken either term. Students who have taken History 103-104 or 105-106 must secure the consent of the instructor. T Th S 8. Mr. MARCHAM and assistants.

This introductory course traces the growth of government, economic life, religion, the arts, and society among the English people. It illustrates in the history of one nation some of the principal developments of Western civilization since early modern times, such as the nation-state, the late Renaissance, the Industrial Revolution, the overseas empire, and state socialism. Lectures and discussion groups. Some of the written work is designed to give elementary training in the interpretation of documentary evidence. Work for the first term ends with the civil wars of the seventeenth century.

115-116. *MEDIEVAL HISTORY*. Throughout the year. May be taken either term. Credit three hours a term. T Th S 9. Mr. MOMMSEN.

A survey of political, social, religious, and intellectual developments in Europe from the fourth century to the fifteenth century.

147. *HISTORY OF RUSSIA TO 1894*. Fall term. Credit three hours. M W F 9. Mr. SZEFTTEL.

Beginnings of Russia, evolution of political institutions and social structure under the Empire, economic development, reform and revolutionary action, main cultural trends, external relations.

148. *THE DECLINE OF THE RUSSIAN MONARCHY AND THE SOVIET PERIOD*. Spring term. Credit three hours. M W F 9. Mr. SZEFTTEL.

The last years of Autocracy and the Revolution of 1905. The Constitutional regime and its end in 1917. Problems of economic, social, political, and cultural life from the October Revolution to the present.

151. *AMERICAN HISTORY: TO 1865*. Fall term. Credit three hours. M W F 9, Mr. DAVIS. M W F 11, Mr. NETTLES. T Th S 9, Mr. ———.

152. *AMERICAN HISTORY: SINCE 1865*. Spring term. Credit three hours. M W F 9, Mr. DAVIS. M W F 11, Mr. NETTELS. T Th S 9, Mr. ———.

161. *HISTORY OF CHINESE CIVILIZATION: TO 1842*. Fall term. Credit three hours. M W F 12. Mr. BIGGERSTAFF.

A rapid survey of the more significant Chinese cultural developments from earliest times until the establishment of formal relations with the West.

162. *HISTORY OF CHINESE CIVILIZATION: SINCE 1842*. Spring term. Credit three hours. M W F 12. Mr. BIGGERSTAFF.

A detailed survey of Chinese history since the beginning of significant Western influence.

165-166. *SCIENCE IN WESTERN CIVILIZATION*. Throughout the year. Credit three hours a term. Open only to upperclassmen. History 165 or consent of the instructor prerequisite to History 166. M W F 11. Mr. GUERLAC.

A survey of the development of science in its relation to the main currents of European and American civilization from classical antiquity to the present day.

[211. *GREEK HISTORY, 500-323 B.C.* Fall term. Credit three hours. Prerequisite, History 101 or the equivalent. M W F 11. Mr. LAISTNER. Not offered in 1956-1957.]

[212. *HELLENISTIC AGE*. Spring term. Credit three hours. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER. Not offered in 1956-1957.]

213. *THE ROMAN REPUBLIC, 133-30 B.C.* Fall term. Credit three hour. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER.

214. *THE ROMAN EMPIRE, 30 B.C.-180 A.D.* Spring term. Credit three hours. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER.

321. *THE CIVILIZATION OF THE ITALIAN RENAISSANCE*. Fall term. Credit three hours. Open to upperclassmen and graduate students. T Th S 11. Mr. MOMMSEN.

A study of political, economic, social, and cultural developments in Italy from the fourteenth century to the middle of the sixteenth century.

322. *EMPIRE AND PAPACY DURING THE MIDDLE AGES*. Spring term. Credit three hours. Open to upperclassmen and graduate students. Prerequisite, History 115-116, or consent of the instructor. T Th S 11. Mr. MOMMSEN.

A study of the main phases in the history of the Roman Empire and the Papacy and a discussion of the ideas underlying the relationship between the two supreme authorities of the Middle Ages from the times of Constantine the Great to those of Pope Boniface VIII and Dante.

[323. *MEDIEVAL GERMANY*. Fall term. Credit three hours. Open to upperclassmen and graduate students. T Th S 11. Mr. MOMMSEN.

A study of the political, social, and cultural history of Germany from the beginnings of the German kingdom in the tenth century to the eve of the Reformation. Not offered in 1956-1957.]

[324. *HISTORIOGRAPHY OF MEDIEVAL EUROPE*. Spring term. Credit three hours. Students should consult the instructor before registering. Hours to be arranged. Mr. MOMMSEN.

A study of the writings of selected historians of medieval Europe, their methods and ideas. Not offered in 1956-1957.]

[326. *THE CIVILIZATION OF THE HIGH MIDDLE AGES*. Spring term. Credit three hours. Open to upperclassmen and graduate students. Prerequisite, at least six hours in European history. T Th S 11. Mr. MOMMSEN.

A study of medieval state and society, thought and culture, during the twelfth and thirteenth centuries, with particular emphasis on France. Not offered in 1956-1957.]

401-402. *EUROPE IN THE NINETEENTH AND TWENTIETH CENTURIES*. Throughout the year. Credit three hours a term. T Th S 11. Mr. FOX.

History 401 and 402 are an intermediate-level sequence of nineteenth- and twentieth-century European history that is designed primarily for sophomores and juniors who have had History 104 or 106. Fall term: it emphasizes the impact of the industrial revolution (in England) and the political revolution (in France) on the

economic, social, and political development of the continent, with special emphasis on France and Germany. Spring term: it stresses the problems of industrial society and political democracy in the twentieth century with special reference to the origins and consequences of the two world wars.

[419-420. *EUROPE IN THE AGE OF THE REFORMATION AND COUNTER-REFORMATION*. Throughout the year. Credit three hours a term. Prerequisite, at least six hours in European history. T Th S 12. Mr. RICE.

A study of European politics and culture in the era of the great religious movements of the sixteenth and early seventeenth centuries. Not offered in 1956-1957.]

422. *FRANCE AND WESTERN EUROPE IN THE FIFTEENTH AND SIXTEENTH CENTURIES*. Spring term. Credit three hours. Open to upperclassmen and graduate students. T Th S 12. Mr. RICE.

An advanced course on the Renaissance in Northern Europe, centered on the institutional and intellectual history of France from the end of the Hundred Years War to the reign of Henry IV.

425-426. *HISTORY OF MODERN GERMANY*. Throughout the year. Credit three hours a term. Prerequisite, History 104, 106, or 401. First term prerequisite to second except by permission of the instructor. Open to upperclassmen and graduate students. T Th S 10. Mr. SIMON.

An advanced study of political, social, and cultural developments and movements in Germany since the Peace of Westphalia, with particular attention to the period since the French Revolution.

429. *THE HISTORIOGRAPHY OF MODERN EUROPE*. Fall term. Credit three hours. Open to seniors with the consent of the instructor and to graduate students. Hours to be arranged. Mr. RICE.

An advanced discussion course on the works of selected modern European historians.

[430. *INTELLECTUAL HISTORY OF EUROPE IN THE NINETEENTH CENTURY*. Spring term. Credit three hours. Prerequisite, History 401, or 916, or Government 321, or consent of the instructor. Open to upperclassmen and graduate students. T Th S 10. Mr. SIMON. Not offered in 1956-1957.]

431. *THE EUROPEAN REVOLUTION, 1789-1848*. Fall term. Prerequisite, History 104 or consent of the instructor. A reading knowledge of French is required. W F 2-3:30. Mr. FOX.

Begins with a critical analysis of the great French Revolution and continues with a survey of the impact of this revolution on the rest of western Europe during the first half of the nineteenth century, particularly as manifested in the revolutions of 1820, 1830, and 1848. A discussion course conducted at an advanced level.

432. *EVOLUTION OF THE FRENCH REPUBLIC*. Spring term. Credit three hours. Prerequisite, History 104 or consent of the instructor. A reading knowledge of French is required. W F 2-3:30. Mr. FOX.

Beginning with a review of the Charter of 1815 and its operation during the Restoration and July Monarchy and emphasizing the periods of the Second Empire and the Third and Fourth Republics. A discussion course at an advanced level.

[451. *HISTORY OF THE WESTERN SLAVS*. Fall term. Credit three hours. Prerequisite, History 103-104, or 107-108, or 147-148. M W 2-3:30. Mr. SZEFTTEL. Not offered in 1956-1957.]

[452. *HISTORY OF THE SOUTHERN SLAVS*. Spring term. Credit three hours. Prerequisite, History 103-104, or 107-108, or 147-148. M W 2-3:30. Mr. SZEFTTEL. Not offered in 1956-1957.]

455-456. *RUSSIAN INTELLECTUAL HISTORY*. Throughout the year. Credit three hours a term. Prerequisite, History 147-148 or consent of the instructor. M W 2-3:30. Mr. SZEFTTEL.

Development of political, religious, philosophical, educational, literary, and artistic ideas from the beginning of Russian history to our times, including the evolution of Marxist ideology under the Soviet regime.

[457. *RUSSIAN CONSTITUTIONAL HISTORY TO PETER THE GREAT*. Fall term. Credit three hours. Prerequisite, History 147-148 or consent of the instructor. For upperclassmen and graduate students. M W 2-3:30. Mr. SZEFTTEL. Not offered in 1956-1957.]

[458. *RUSSIAN HISTORIOGRAPHY*. Spring term. Credit three hours. Prerequisite, History 147-148 or consent of the instructor. M W 2-3:30. Mr. SZEFTTEL.

Principal sources for Russian history; development of Russian historical writing. Not offered in 1956-1957.]

511-512. *ENGLISH CONSTITUTIONAL HISTORY*. Throughout the year. Credit three hours a term. Prerequisite, History 107-108 or consent of the instructor. Each term's work may be taken separately. T Th S 11. Mr. MARCHAM.

The growth of English institutions from Anglo-Saxon times to the present, including the government of the empire and commonwealth. Emphasis is given to the study of the pertinent sources. The work of the first term ends at 1485.

[515. *HISTORY OF ENGLAND UNDER THE TUDORS AND STUARTS*. Spring term. Credit three hours. Prerequisite, History 107-108 or consent of the instructor. T Th S 11. Mr. MARCHAM. Not offered in 1956-1957.]

[517. *HISTORY OF ENGLAND IN THE NINETEENTH CENTURY*. Fall term. Credit three hours. Prerequisite, History 107-108 or consent of the instructor. T Th S 11. Mr. MARCHAM. Not offered in 1956-1957.]

[518. *HISTORY OF ENGLAND IN THE TWENTIETH CENTURY*. Spring term. Credit three hours. Prerequisite, History 107-108 or consent of the instructor. T Th S 11. Mr. MARCHAM. Not offered in 1956-1957.]

[711. *AMERICAN COLONIAL HISTORY TO 1763*. Fall term. Credit three hours. For upperclassmen and graduates. T Th 12 and an hour to be arranged. Mr. NETTELS. Not offered in 1956-1957.]

712. *THE AGE OF WASHINGTON, 1763-1800*. Spring term. Credit three hours. For upperclassmen and graduates. T Th 12 and an hour to be arranged. Mr. NETTELS.

The struggle for American independence, the making of the Constitution, the founding of the federal government, and the shaping of national policies.

717. *AMERICAN BIOGRAPHY*. Fall term. Credit three hours. For upperclassmen and graduates. T Th 12 and an hour to be arranged. Mr. NETTELS.

721-722. *AMERICAN HISTORY: HISTORY OF THE WEST*. Throughout the year. Credit three hours a term. For upperclassmen and graduate students. M W F 12. Mr. ———.

Western migration, internal improvements, agriculture, growth of democracy and nationalism, federal and state relations.

[725-726. *RECENT AMERICAN HISTORY*. Throughout the year. Credit three hours. An intensive course for upperclassmen and graduate students. M W F 12. Mr. GATES.

Emphasis will be placed on industrial changes, business consolidation, labor problems, conservation, growth of social control, World Wars I and II, the Great Depression, the New Deal, America in world affairs. Not offered in 1956-1957.]



*AMERICA AS A WORLD POWER.* (American Studies 301-302.)

731-732. *AMERICAN INTELLECTUAL HISTORY.* Throughout the year. Credit three hours a term. Prerequisite, one or more of the following: History 151-152, English 329-330, Government 235. Open to upperclassmen and graduate students. T Th S 10. Mr. DAVIS.

An analysis of American beliefs and values concerning religion, nature (including art and science), human nature, and the significance of the American experience. Readings will include selected works of theologians, historians, philosophers, political, economic, and legal theorists, and writers of fiction. The major themes will be the American adaptation and modification of European ideologies, the development of a dominant current of liberal thought, and the repeated challenges to this liberal philosophy. Some attempt will be made to relate ideology with economic background and social institutions.

811. *MODERNIZATION OF CHINA: 1842-1911.* Fall term. Credit three hours. Prerequisite, consent of the instructor. Conducted as a seminar. M 3-5. Mr. BIGGERSTAFF.

Topical study of the impact of Western civilization upon traditional China.

812. *MODERNIZATION OF CHINA: SINCE 1911.* Spring term. Credit three hours. Prerequisite, consent of the instructor. Conducted as a seminar. M 3-5. Mr. BIGGERSTAFF.

Topical study of changes in China since the Revolution of 1911.

911. *ORIGINS OF MODERN SCIENCE.* Fall term. Credit three hours. Prerequisite, History 165-166 or consent of the instructor. T Th 2. Mr. GUERLAC.

Reading and discussion of scientific classics important for understanding the Scientific Revolution of the seventeenth century from Galileo to Newton.

912. *THE AGE OF AUTHORITY (1589-1715).* Spring term. Credit three hours. Open to sophomores and upperclassmen who have completed six hours of work in history. M W F 9. Mr. GUERLAC.

A survey of European history in the seventeenth century, with special emphasis upon the rise of French monarchical institutions from the reign of Henry IV through that of Louis XIV.

[916. *THE CENTURY OF ENLIGHTENMENT.* Spring term. Credit three hours. M W F 9. Mr. GUERLAC.

France in the eighteenth century, with special attention to the thinkers of the Age of Reason from Bayle and Fontenelle to the French Revolution. Not offered in 1956-1957.]

### HONORS PROGRAM

614. *HONORS PROSEMINAR.* Spring term. Credit three hours. Open only to juniors accepted as candidates for Honors in History. M 2-4. Mr. RICE.

Training and practice in the use of historical materials and in historical writing; discussion of various methods of research and various types of historical explanation. Considerable time will be devoted to the systematic composition of a term paper.

615-616. *SENIOR HONORS GUIDANCE.* Throughout the year. Credit three hours a term. Prerequisite, History 614.

The year will be devoted to the writing of an Honors essay under the guidance of a member of the department, and to extensive reading in preparation for a comprehensive oral examination in the field of History.

See also History 324 and 429.



## GRADUATE SEMINARS

[275-276. *SEMINAR IN GREEK AND ROMAN HISTORIOGRAPHY*. Throughout the year. Credit three hours a term. T 2-4. Mr. LAISTNER. Not offered in 1956-1957.]

277-278. *SEMINAR IN ROMAN HISTORICAL INSCRIPTIONS*. Throughout the year. T 2-4. Mr. LAISTNER.

379-380. *SEMINAR IN MEDIEVAL HISTORY*. Throughout the year. Hours to be arranged. Mr. MOMMSEN.

477-478. *SEMINAR IN EUROPEAN HISTORY DURING THE ERA OF THE REFORMATION*. Throughout the year. Hours to be arranged. Mr. RICE.

481-482. *SEMINAR IN MODERN EUROPEAN HISTORY*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. FOX.

483-484. *SEMINAR IN THE CULTURAL HISTORY OF MODERN EUROPE*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. SIMON.

In 1956-1957, selected topics in German history.

495-496. *SEMINAR IN RUSSIAN AREA STUDIES*. Throughout the year. Credit and hours to be arranged. Open to seniors and graduate students. Prerequisite, consent of Mr. SZEFTTEL. Messrs. CLARK, FAIRBANKS, NABOKOV, and others.

575. *SEMINAR IN TUDOR AND STUART HISTORY*. Spring term. Credit three hours a term. Open to a limited number of undergraduates and graduates. Hours to be arranged. Mr. MARCHAM.

775-776. *SEMINAR IN AMERICAN HISTORY*. One or two terms during the year. Credit three hours a term. Hours to be arranged. Mr. NETTELS.

[782. *SEMINAR IN AMERICAN HISTORY*. Spring term. Credit three hours. Hours to be arranged. Mr. GATES. Not offered in 1956-1957.]

875-876. *SEMINAR IN MODERN CHINESE HISTORY*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. BIGGERSTAFF.

975-976. *SEMINAR IN THE HISTORY OF SCIENCE*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. GUERLAC.

## LITERATURE

WILLIAM M. SALE, JR., *Chairman*; MESSRS. H. D. ALBRIGHT, HARRY CAPLAN, JEAN COLLIGNON, J. M. ECHOLS, E. G. FOGEL, J. S. HANNESSON, JAMES HUTTON, W. R. KEAST, GORDON M. KIRKWOOD, VICTOR LANGE, J. A. MAZZEO, A. M. MIZENER, E. B. PARTRIDGE, V. NABOKOV, D. G. SCHAAL, H. E. SHADICK, FRIEDRICH SOLMSEN.

*The aim of major study in the Interdepartmental Courses in Literature is three-fold: to give the student (a) a sense of the continuity of human thought and experience through year courses in literature and related subjects that span the ancient and the modern world; (b) a knowledge of the relevancy to the modern world of the literature, culture, and art of the classical world, of the medieval world, or of the Orient; and (c) a knowledge of one of the periods in modern history when ideas and inspirations have found expression almost simultaneously in the culture and art of several nations. These aims may be satisfied in part by courses that trace the development in the literature of various countries of one of the major literary forms or of critical theory. A fuller description of aims and requirements, including typical programs, may be obtained from the Chairman.*

*Required courses (24 hours):* (a) *Literature 101-102, 303-304*; (b) 6 hours in either classical, medieval, or Chinese literature; and (c) 6 hours in the literature either of the Renaissance, the Age of Reason, the Romantic Period, or the nineteenth century. At least 6 hours of literature in a foreign language must be elected.

*Related courses (24 hours):* Four-year courses (or combinations of term courses) in history, Far Eastern studies, philosophy, government, literature, music, fine arts, architecture, so chosen as to supplement in each case one of the required courses.

Courses satisfying the distribution requirements of the College may be used in satisfying required or related courses.

Candidates for Honors in Literature should have a general academic average of 80 or better; should establish their qualifications for and be admitted to the Honors Seminars offered by the Department of Classics, or by one of the Departments of Modern Literature, including English; and should anticipate taking in the spring of their senior year comprehensive examinations based on a reading list and on the work of seminars. The reading list may be secured from the Chairman.

**101-102. INTRODUCTION TO LITERATURE.** Throughout the year. Credit three hours a term. First term prerequisite to second. For sophomores and upperclassmen. Prospective majors in literature should ensure a place in the course by applying to the Chairman before or during the first three days of preregistration. M W F 9, 10, 11, 12, 2; T Th S 9, 10, 11. Mr. MAZZEO and others.

A study of narrative prose, drama, and poetry selected from the literature of the world. The purpose of the course is to set forth the particular contribution made by literature to an understanding of human values.

Literature 101 will also be offered in the spring term but only for freshmen exempted from English 112. No others will be admitted. Hours for spring term, M W F 11, 12; T Th S 10. Literature 102 will be offered M W F 12; T Th S 9, 10 in the fall term but only for those who had 101 in the spring term of 1955.

**201-202. ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS.** Throughout the year. Credit three hours a term. First term prerequisite to the second. For sophomores and upperclassmen. T 2-4 or Th 2-4, and an hour to be arranged. Mr. HUTTON.

Rapid reading in the best translations with emphasis upon Greek masterpieces, for example, the *Iliad* and the *Odyssey*, the tragedies of Sophocles, and several dialogues of Plato. Translations from the Latin will be chosen for the bearing of the original works upon modern literature.

**207. FOUNDATIONS OF WESTERN THOUGHT.** Fall term. Credit three hours. For sophomores and upperclassmen. T Th S 11. Mr. SOLMSEN.

A study of the beliefs and ideas—religious, moral, social, and scientific—that were current or advanced in the Greek, Roman, and Early Christian period of Western civilization; the history of these ideas and their integration into coherent bodies of thought. Popular thought and practices as well as the ideas of leading thinkers and poets will be considered. Attention will be given to the influence of these ideas on later thought and their relation to present-day problems. Reading of representative material in translation. Lectures and discussion.

**208. EARLY CHRISTIAN LITERATURE AND ITS HELLENIC BACKGROUND.** Spring term. Credit three hours. For sophomores and upperclassmen. T Th S 11. Mr. SOLMSEN.

An introduction to the movements of religious thought and belief between Plato and St. Augustine. The religious atmosphere before the rise of Christianity; Oriental cults in the Greek world; the writings of the New Testament; early developments of Christian thought and literature.

**211-212. SURVEY OF MEDIEVAL LITERATURE.** Throughout the year. Credit

three hours a term. First term prerequisite to the second. For sophomores and upper-classmen. T Th S 9. Mr. MAZZEO.

Fall term: A critical study of Dante's works in English translation with special reference to the *Divine Comedy*. Collateral readings in background material, selected to illuminate Dante's major themes and his principles of literary structure. Lectures, discussions, and reports. Spring term: A survey of representative works of European literature from the fourth to the fifteenth century in translation. Emphasis will be placed on the unique medieval contribution to the art of literature, its themes and forms. Lectures, discussions, and reports.

214. *HUMANISM AND THE RENAISSANCE*. Spring term. Credit three hours. For upperclassmen, and sophomores by permission of the instructor. M W F 10. Mr. HUTTON.

Readings in translation from Petrarch, Erasmus, Ariosto, Rabelais, Tasso, Montaigne, and others, designed to bring out typical ideas and attitudes of the Renaissance period. Attention will be given to such topics as fifteen-century Humanism; neo-Latin literature; Ciceronianism; Renaissance Platonism; theories of poetry; the influence of the Counter Reformation.

218. *CLASSIC MYTHS*. Fall term. Credit three hours. For sophomores and upper-classmen. T Th S 9. Mr. KIRKWOOD.

A study of the principal cycles of Greek mythology—for example, the myths of the Gods, the Trojan Cycle, the Argive and Theban Cycles—with special emphasis on their representation in literature. Anthropological aspects of the myths and their background in prehistory will be considered. Lectures will be illustrated from the collection of slides in the possession of the Department of Classics.

301-302. *DRAMA AND THE THEATRE*. Throughout the year. Credit three hours a term. Students with specialized interest in drama or the theatre should elect this course preferably as early as the sophomore year. M W F 11. Fall term, Mr. PARTRIDGE. Spring term, Mr. SCHAAL.

An introduction to representative types and forms of drama as interpreted in the theatre, designed to increase appreciation of the drama as literature and of the theatre as art form and social institution. The development of dramatic literature, the distinguishing qualities of its chief types (tragedy, comedy, melodrama, farce), and the basic principles of dramaturgy will be illustrated by ancient and modern plays. This survey will be paralleled by tracing the development of the physical stage and of the changing theories and techniques of theatrical production in the important stylistic periods from the Greeks to the present.

303-304. *THE LITERATURE OF EUROPE*. Throughout the year. Credit three hours a term. Prerequisite, Literature 101-102. First term prerequisite to second. T Th S 10. Fall term, Mr. FOGEL. Spring term, Mr. MIZENER.

Fall term: reading of such representative authors as Chaucer, Malory, Erasmus, Machiavelli, Rabelais, Montaigne, Shakespeare, Bacon, and Donne. Spring term: reading of such representative authors as Pope, Rousseau, Byron, Stendhal, Trollope, Henry Adams, and Shaw. All foreign works will be read in English translations.

309-310. *THE DEVELOPMENT OF THE EUROPEAN NOVEL*. Throughout the year. Credit three hours a term. M W F 12. Mr. LANGE.

A study of the main representatives of European fiction, with special emphasis upon the evolution of the forms of fiction. The first term will analyze certain French, English, and German contributions to the history of the novel before 1830; the second term will be devoted to a study of selected works of the nineteenth and twentieth centuries, between Dickens and Kafka. All foreign works will be read in English translation.

311-312. *MASTERS OF EUROPEAN FICTION*. Throughout the year. Credit three hours a term. M W F 12. Mr. NABOKOV.

Selected English, Russian, French, and German novels and short stories of the nineteenth and twentieth centuries will be read. Special attention will be paid to individual genius and questions of structure. All foreign works will be read in English translation.

318. *SOUTHEAST ASIAN LITERATURE IN TRANSLATION*. Spring term. Credit three hours. T 2-4. Mr. ECHOLS.

321. *CHINESE HISTORICAL AND PHILOSOPHICAL LITERATURE IN TRANSLATION*. Fall term. Credit three hours. M W F 10. Mr. SHADICK.

Philosophical and historical literature, including Confucian, Taoist, and Buddhist writings.

322. *CHINESE IMAGINATIVE LITERATURE IN TRANSLATION*. Spring term. Credit three hours. M W F 10. Mr. SHADICK.

Imaginative literature, including poetry, classical prose, fiction, drama, and the new writing of the twentieth century.

*MASTERS OF GERMAN LITERATURE*. (German 301-302.)

*ASPECTS OF GERMAN CULTURE*. (German 303.)

[*SELECTED MASTERPIECES OF FRENCH LITERATURE*. (French 305-306.) Not offered in 1956-1957.]

325-326. *RUSSIAN LITERATURE IN TRANSLATION*. Throughout the year. Credit three hours a term. M W F 11. Mr. NABOKOV.

A survey of Russian prose and poetry, with particular emphasis on the nineteenth century.

329-330. *CONTEMPORARY TENDENCIES IN FRENCH AND EUROPEAN LITERATURES*. Throughout the year. Credit three hours a term. M W F 9. Mr. COLLIGNON.

First term: a discussion of such outstanding French authors as Rimbaud, Proust, Gide, and their European counterparts (e.g., Nietzsche, Dostoevsky, Mann). Second term: a study of present-day movements in such authors as Mauriac, Malraux, and the Existentialists, and in such related European writers as D. H. Lawrence, Joyce, and Kafka. All foreign works will be read in English translation.

[331-332. *THE CLASSICAL SPIRIT IN FRANCE AND ENGLAND*. Not offered in 1956-1957.]

340. *EDDA AND SAGA*. Spring term. Credit three hours. T Th S 11. Mr. HANNESSON.

A survey of medieval Icelandic poetry, prose fiction, and historical narrative. Readings in translation from the Elder Edda, the mythological and historical works of Snorri Sturluson, the Sagas of Icelanders, and Mythical-Heroic Sagas.

401-402. *PRINCIPLES OF LITERARY CRITICISM*. Throughout the year. Credit three hours a term. Fall term, M 2-4 or W 2-4. Mr. CAPLAN. Spring term, M W F 2. Mr. KEAST.

Theories of literary art. In the fall term, consideration will be given to Greek and Roman criticism; in the spring term, to criticism from the Renaissance to the present day.

# MATHEMATICS

Mr. R. J. WALKER, *Chairman*; Messrs. R. P. AGNEW, H. D. BLOCK, Miss T. M. CHANEY, Messrs. C. C. CHANG, H. K. FLESCHE, W. H. J. FUCHS, S. GAL, Mrs. I. L. GAL, Messrs. J. HARTMANIS, C. S. HERZ, G. A. HUNT, J. B. JOHNSTON, M. KAC, J. C. KIEFER, P. OLUM, H. POLLARD, D. B. RAY, J. B. ROSSER, M. SCHREIBER, H. WIDOM, J. WOLFOWITZ.

For a major in Mathematics, the following courses must be completed: (1) in Mathematics, at least fifteen hours of courses numbered 194 or above, including at least one of the following full-year courses, 371-372, 401-402, 403-404, 501-502; (2) in related subjects, at least fifteen hours to be selected from approved courses in Astronomy, Chemistry, Economics, Education, French, Geology, German, Italian, Philosophy, Physics, and Russian.

Students who wish to take the Honors program in Mathematics must include in their program Mathematics 501-502, Mathematics 371-372, and Mathematics 613-614, or the equivalent in other advanced courses. In addition, they must take at least two semesters of the Honors seminar and pass a comprehensive examination in Mathematics.

Students planning to teach mathematics in secondary schools should make themselves familiar with the New York State requirements. They should bear in mind that the teaching of mathematics is frequently combined with teaching of physical science or general science. The Department of Mathematics recommends, as minimum preparation for teaching the subject, Mathematics 181, 182, and six additional hours selected from the following list: 183, 201, 241, 401, 403, 501. Students planning to teach primarily mathematics should meet the requirements for a major in the subject.

Students wishing to take any of the courses numbered above 183 are invited to confer, before registering, with the instructor concerned.

Of courses 121 to 194 not more than six hours may be taken simultaneously without the special permission of the Department.

Qualified students may register for informal study. Undergraduates should register for courses 031-071; graduate students should register for courses 931-971.

\*121-122. **SELECTED TOPICS IN MATHEMATICS.** Throughout the year. Credit three hours a term. Prerequisites, Plane Geometry and Intermediate Algebra. First term prerequisite to the second. M W F 10, T Th S 9.

This course is intended for students who do not plan to take many courses in mathematics, but who nevertheless wish to become acquainted with the principal ideas of modern mathematics. The object will be to make clear the fundamental aims, methods, and results of a number of subjects, rather than to develop the technique of any one subject. Although this course is not designed to satisfy prerequisites for courses in Analytic Geometry and Calculus, a student who has passed it with a sufficiently high grade may be admitted to such courses. The course will not serve the purpose of a review course to improve faulty preparation in elementary mathematics.

\*133. **PLANE TRIGONOMETRY.** Either term. Credit three hours except for students offering Trigonometry for entrance. Prerequisites, Plane Geometry and Intermediate Algebra. M W F 2, T Th S 9.

151. **MATHEMATICS FOR THE SOCIAL SCIENCES.** Fall term. Credit four hours. Prerequisite, Intermediate Algebra. M W F 11 and an hour to be arranged. Mr. POLLARD.

Courses 151-152-153 form a sequence intended to present the basic mathematics useful in the social sciences and humanities. Students other than graduate students in these fields will be admitted only with the consent of the teacher. No credit will



be given to students who have already taken Mathematics 161, 162, 163 or 181, 182, 183.

The sequence of courses will begin with a month's review of elementary mathematics and then take up the study of the logical basis of mathematics, set theory, and axiomatics. Considerable attention will be given to calculus in one and several variables. The course will conclude with topics from Modern Algebra such as group or lattice theory, linear programming, and difference equations.

Students are warned that neither probability nor statistics will be treated in this course. However, Mathematics 153 will serve as a prerequisite to Mathematics 711.

152. *MATHEMATICS FOR THE SOCIAL SCIENCES*. Spring term. Credit three hours. Prerequisite, Mathematics 151. M W F 11. Mr. POLLARD.

[153. *MATHEMATICS FOR THE SOCIAL SCIENCES*. Fall term. Credit three hours. Prerequisite, Mathematics 152. M W F 11. Mr. POLLARD. Not given in 1956-1957.]

\*161. *ANALYTIC GEOMETRY AND CALCULUS*. Either term. Credit three hours. Prerequisite, Trigonometry and Intermediate Algebra. Hours to be arranged.

Plane analytic geometry through conics. Differentiation and integration of polynomials with applications to rates, maxima, volumes, pressures, etc.

Courses 161-162-163 represent a standard three-term calculus sequence, presenting the main ideas and techniques of the calculus and analytic geometry; the material is so arranged that the first two terms (161-162) provide a reasonably complete introduction to the subject.

This sequence of courses is not intended as preparatory to more advanced courses in mathematics, although admission to such courses can be obtained following this sequence by special permission. (For students who took the 161-162-163 sequence when it was the only one offered, this will continue to serve as the prerequisite to advanced work.) Students majoring in mathematics or in those physical sciences where mathematics is extensively used or who have special mathematical competence should elect the 181-182-183 sequence instead.

\*162. *ANALYTIC GEOMETRY AND CALCULUS*. Either term. Credit three hours. Prerequisite, Mathematics 161. Hours to be arranged.

Differentiation and integration of algebraic, trigonometric, logarithmic, and exponential functions, with applications. Related topics, including polar coordinates, parametric equations, and vectors.

163. *ANALYTIC GEOMETRY AND CALCULUS*. Either term. Credit three hours. Prerequisite, Mathematics 162. Hours to be arranged.

Infinite series, solid analytic geometry, partial derivatives, and multiple integrals.

\*181. *ANALYTIC GEOMETRY AND CALCULUS*. First term. Credit three hours. Prerequisite, Trigonometry and Intermediate Algebra. Hours to be arranged.

The range of topics will be similar to that of Mathematics 161, but each will be covered more intensively. Intended primarily for students of superior mathematical ability. (See remarks under Mathematics 161 above.)

\*182. *ANALYTIC GEOMETRY AND CALCULUS*. Second term. Credit three hours. Prerequisite, Mathematics 181. Hours to be arranged.

Topics similar to those of Mathematics 162.

183. *ANALYTIC GEOMETRY AND CALCULUS*. First term. Credit three hours. Prerequisite, Mathematics 182. Hours to be arranged.

Topics similar to those of Mathematics 163.



\*192. *CALCULUS*. Spring term. Credit three hours. Prerequisite, consent of the teacher. M W F 12. Mr. OLUM.

A substitute for Mathematics 182, intended for students with exceptional ability and interest in mathematics.

193. *CALCULUS*. Fall term. Credit three hours. Prerequisite, Mathematics 192 or consent of the teacher. M W F 12. Mr. POLLARD.

Continuation of Mathematics 192 and a substitute for Mathematics 183.

194. *CALCULUS*. Spring term. Credit three hours. Prerequisite, Mathematics 193 or consent of the teacher. This course serves as a prerequisite for all courses which require 201 as a prerequisite. M W F 12. Mr. POLLARD.

Continuation of Mathematics 193. Includes a treatment of differential equations.

201. *ELEMENTARY DIFFERENTIAL EQUATIONS*. Either term. Credit three hours. Prerequisite, Mathematics 163. Fall term, M W F 8, T Th S 11. Spring term, M W F 12, 2, T Th S 10.

Solution of ordinary differential equations by analytic and numerical methods.

241. *SURVEY OF MATHEMATICS*. Spring term. Credit three hours. Prerequisite, Mathematics 162 or consent of the teacher. M W F 9. Mr. ———.

Primarily for undergraduates. Review of elementary mathematics from a more advanced viewpoint. Introduction to the general character of higher mathematics. Particularly intended for prospective teachers and those with a cultural interest in mathematics.

281–282. *HONORS SEMINAR*. Throughout the year. Credit three hours a term. Prerequisite, provisional acceptance as a candidate for honors. Hours to be arranged. Mr. KAC.

For juniors and seniors. Students will discuss mathematical topics under the guidance of one or more members of the staff. This seminar is required of all students expecting to graduate with Honors in Mathematics.

[301. *DETERMINANTS AND MATRICES*. Spring term. Credit three hours. Prerequisite, Mathematics 183. Not given in 1956–1957.]

[341. *ELEMENTARY THEORY OF NUMBERS*. Spring term. Credit three hours. Prerequisite, Mathematics 182. Not given in 1956–1957.]

371–372. *INTRODUCTION TO MODERN ALGEBRA*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 183. First term prerequisite to second. T Th S 9. Mr. CHANG.

Primarily for undergraduates. Topics in modern algebraic theories, such as the number system, groups, fields, matrices, and Galois Theory.

373–374. *MODERN ALGEBRA*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 183. First term prerequisite to second. T Th S 10. Mr. ———.

For graduate students and qualified undergraduates. An introductory course in abstract algebra, serving as a basis for further work in algebra and geometry.

[377–378. *SEMINAR IN ALGEBRA*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 374. Not given in 1956–1957.]

381. *FOUNDATIONS OF MATHEMATICS*. Fall term. Credit three hours. Prerequisite, at least three semester hours of mathematics beyond the calculus. M W F 10. Mrs. GAL.

For graduate students and qualified undergraduates. A careful study of a system of symbolic logic; its value in furnishing a test for the validity of mathematical reasoning will be stressed.

382. *SYMBOLIC LOGIC*. Spring term. Credit three hours. Prerequisite, Mathematics 381. M W F 10. Mrs. GAL.

For graduate students and qualified undergraduates. A study of advanced topics in symbolic logic. Applications to mathematical reasoning will be stressed.

387-388. *SEMINAR IN MATHEMATICAL LOGIC*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 382 or consent of the teacher. Hours to be arranged. Messrs. CHANG and ROSSER.

For graduate students or qualified undergraduates. Topics in mathematical logic of interest to students and teacher.

401-402. *PROJECTIVE GEOMETRY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 182. First term prerequisite to second. T Th S 8. Mr. JOHNSTON.

Primarily for undergraduates. Vectors; projective properties of lines, planes, and conics; perspective drawing; lattices connected with geometries.

[403-404. *INTRODUCTION TO GEOMETRICAL THEORY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 182. Not given in 1956-1957.]

415-416. *ALGEBRAIC TOPOLOGY*. Throughout the year. Credit three hours a term. Prerequisite, consent of the teacher. First term prerequisite to second. Hours to be arranged. Mr. OLUM.

For graduate students and qualified undergraduates. Homology and cohomology theory and (to a lesser extent) homotopy theory of complexes and general topological spaces. Applications to basic geometric properties of such spaces.

427-428. *SEMINAR IN TOPOLOGY*. Throughout the year. Credit three hours a term. Prerequisite, consent of the teacher. Hours to be arranged. Mr. ———.

For graduate students and qualified undergraduates. Topics in topology of interest to students and teacher.

431. *DIFFERENTIAL GEOMETRY*. Spring term. Credit three hours. Prerequisite, Mathematics 183. M W F 10. Mr. HARTMANIS.

Primarily for undergraduates. Three-dimensional vector analysis, and applications to curves and surfaces in three dimensions.

[439-440. *DIFFERENTIAL AND RIEMANNIAN GEOMETRY*. Throughout the year. Credit three hours a term. Prerequisite, consent of the teacher. Not given in 1956-1957.]

[451-452. *ALGEBRAIC GEOMETRY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 183. Not given in 1956-1957.]

501-502. *ADVANCED CALCULUS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 183. First term prerequisite to second. T Th S 11. Mr. SCHREIBER.

For graduate students and qualified undergraduates. A careful study of limits, continuity, derivatives, and Riemann integrals. Functions of several variables. Multiple and line integrals. The course is designed to furnish necessary preparation for advanced work in analysis and applied mathematics. Emphasis is placed on the logical development of the calculus, rather than on a wide range of formal applications.

505. *FOUNDATIONS OF ANALYSIS*. Fall term. Credit three hours. Prerequisite, Mathematics 501. M W F 11. Mr. GAL.

For graduate students and qualified undergraduates. A study of the elementary set-theoretic, algebraic, and topological notions necessary for the development of the real numbers and the function spaces of analysis.

506. *MEASURE AND INTEGRATION*. Spring term. Credit three hours. Prerequisite, Mathematics 505. M W F 11. Mr. GAL.

For graduate students and qualified undergraduates. Lebesgue measure and integration. Stieltjes integrals. Fourier series.

517-518. *FUNCTIONAL ANALYSIS AND APPLICATIONS*. Throughout the year. Prerequisite, Mathematics 506. First term prerequisite to second. Hours to be arranged. Mr. HERZ.

For graduate students and qualified undergraduates. Banach spaces, orthogonal series, and commutative normed rings. Abstract methods will be applied to classical problems in Fourier series, differential and integral equations, and the theory of probability.

527-528. *SEMINAR IN ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisites, Mathematics 506 and consent of the teacher. Hours to be arranged. Mr. ———.

For graduate students and qualified undergraduates. Topics in advanced analysis of interest to students and teacher.

529. *INTRODUCTION TO FUNCTIONS OF A COMPLEX VARIABLE*. Spring term. Credit three hours. Prerequisite, Mathematics 183. T Th S 9. Miss CHANEY.

Primarily for undergraduates. An elementary treatment of topics in the theory of functions of a complex variable, including integration, conformal mapping, and the theory of residues.

[531-532. *COMPLEX VARIABLES*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 502, 612, or 614. Not given in 1956-1957.]

[537-538. *FOURIER ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 506. Not given in 1956-1957.]

[543-544. *ANALYTIC NUMBER THEORY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 532. Not given in 1956-1957.]

607. *APPLIED MATHEMATICS FOR ELECTRICAL ENGINEERS*. Spring term. Credit three hours. Prerequisite, Mathematics 163. Hours to be arranged.

Complex numbers, determinants, Fourier series, solution of algebraic and transcendental equations, vector algebra, theory of errors, and dimensional analysis.

611-612. *HIGHER CALCULUS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 201. First term prerequisite to second. T Th S 9, 10. Messrs. BLOCK and WIDOM.

Primarily intended for students who do not have sufficient time available for mathematical electives to permit taking the four-term sequence 613-616 and who do not have sufficient mathematical maturity to take 621-622. Partial differentiation, multiple and line integrals, Fourier series, partial differential equations, vector analysis, complex variables, calculus of variations, Laplace transforms. Emphasis is placed on a wide range of formal applications of the calculus rather than on the logical development. The second term will be accepted as prerequisite to Complex Variables.

613-614. *METHODS OF APPLIED MATHEMATICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 183 and 201. First term prerequisite to second. Students not majoring in Engineering Physics must secure the consent of the teacher. T Th S 10. Mr. RAY.

This constitutes the first year of a two-year sequence and should be taken only by students who intend to cover the remaining topics either by taking the continuation 615-616 or by taking other courses such as 531. Courses 613-616 cover

essentially the same ground as 611, 612, 621, 622, but in a more coordinated fashion. Topics to be covered are vector analysis, calculus of functions of several variables, infinite series. Fourier series and integrals, Laplace transforms, complex numbers, matrix theory.

615-616. *METHODS OF APPLIED MATHEMATICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 614. First term prerequisite to second. M W F 12. Mr. ROSSER.

Intended primarily as the second year of the two-year sequence beginning with 613. However, with consent of the teacher, 615 alone can be taken by students who have not had 613-614 and who require a background in complex variables for scientific applications. Topics to be covered are complex variable theory, partial differential equations, special functions, calculus of variations.

621-622. *MATHEMATICAL METHODS IN PHYSICS*. Throughout the year. Credit four hours a term. Prerequisites, a good knowledge of the techniques of the calculus, such as given by 611-612, and at least two years of general physics. First term prerequisite to second. T W Th F 12. Mr. AGNEW.

For mature students who wish to acquire a wide background of mathematical techniques in one year. Lectures and problem work designed to give the students a working knowledge of the principal mathematical methods used in advanced physics. Topics taken up include infinite series, Fourier series and integrals, Laplace transforms, complex variables, calculus of variations, matrices, integral equations, and eigenvalue problems.

[641-642. *PARTIAL DIFFERENTIAL EQUATIONS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 612. Not given in 1956-1957.]

661. *NUMERICAL ANALYSIS*. Fall term. Credit three hours. Prerequisite, Mathematics 201 or consent of the teacher. M W F 9. Mr. WALKER.

Primarily for undergraduates. The elements of modern numerical computation, including interpolation, numerical differentiation and integration, and the solution of linear, nonlinear, and ordinary differential equations. The facilities of the Cornell Computing Center are available to the students, and coding for the automatic calculator will be taught.

662. *NUMERICAL ANALYSIS*. Spring term. Credit three hours. Prerequisite, Mathematics 661 or 621 or consent of the teacher. M W F 9. Mr. WALKER.

Primarily for undergraduates. Solution of linear equations and matrix inversion and eigenvalue problems. Numerical solution of partial differential equations. Theory and use of automatic calculating machines.

663-664. *SEMINAR IN NUMERICAL ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 662 or consent of the teacher. M W F 10. Mr. ROSSER.

For graduate students or qualified undergraduates. Topics in numerical analysis of interest to students and teacher.

711-712. *ELEMENTARY MATHEMATICAL STATISTICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 163 or 183. First term prerequisite to second. M W F 11. Mr. ———.

Primarily for undergraduates or for graduate students in areas of applications of statistics. Topics in probability which are essential to an understanding of statistics; introduction to the mathematical principles underlying modern statistical inference. Emphasis is on the rationale underlying the choice of statistical methods in various situations.

721. *PROBABILITY*. Fall term. Credit three hours. Prerequisite, either Mathematics 502, 612, 614, 622, or consent of the teacher. M W F 11. Mr. KIEFER.

Fundamentals. Combinatorial problems. Distribution functions in one or several dimensions. Important probability laws. Expectation, moments, and characteristic functions. Stochastic convergence and the law of large numbers. The central limit theorem.

722. *STATISTICAL INFERENCE*. Spring term. Credit three hours. Prerequisite, Mathematics 721, or consent of the teacher. M W F 11. Mr. KIEFER.

Introduction to the theory of point estimation. Consistency, efficiency, and sufficiency; the method of maximum likelihood. The classical tests of hypotheses and their power. The theory of confidence intervals. The basic concepts of statistical decision theory.

This course is intended to furnish a rigorous introduction to mathematical statistics. It is a prerequisite to all advanced courses in statistics.

724. *ADVANCED PROBABILITY*. Credit three hours. Prerequisite, Mathematics 721. M W 2-3:15. Mr. ———.

For graduate students and qualified undergraduates. Topics in advanced probability such as Markov chains, renewal theory, random walk and diffusion theory, the ergodic theorem; advanced limit theorems.

[725. *STOCHASTIC PROCESSES*. Spring term. Credit three hours. Prerequisite, consent of the teacher. Not given in 1956-1957.]

[731-732. *ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 722 or consent of instructor. First term prerequisite to second. Not given in 1956-1957.]

[741-742. *STATISTICAL ESTIMATION, TESTS, AND DECISION FUNCTIONS*. Throughout the year. Credit three hours. Prerequisite, Mathematics 722 or consent of the teacher. First term prerequisite to second. Not given in 1956-1957.]

747. *SEQUENTIAL ANALYSIS*. Fall term. Credit three hours. Prerequisite, Mathematics 722 or consent of the teacher. M W 2-3:15. Mr. ———.

For graduate students and qualified undergraduates. The Wald theory of sequential tests of statistical hypotheses. Sequential estimation. Connections with decision theory. Stochastic approximation methods. Recent results.

761-762. *SEMINAR IN ADVANCED MATHEMATICAL STATISTICS*. Throughout the year. Credit three hours a term. Prerequisite, consent of the teacher. M 4-6. Mr. KIEFER.

For graduate students and qualified undergraduates. Detailed discussion of selected advanced topics which will vary from year to year. Discussion of current research and recent literature.

## READING, RESEARCH, AND INFORMAL STUDY

For properly qualified students, members of the Department will direct reading and research not necessarily associated with any course. Undergraduates should register for courses 031-071; graduate students should register for courses 931-971.

031, 931. *READING IN ALGEBRA*.

041, 941. *READING IN GEOMETRY*.

051, 951. *READING IN ANALYSIS*.

061, 961. *READING IN APPLIED MATHEMATICS*.

071, 971. *READING IN PROBABILITY AND STATISTICS*.



## MODERN FOREIGN LANGUAGES AND LITERATURES

Courses in Modern Foreign Languages and Literatures are offered by the following divisions of the College:

Department of German Literature, Mr. VICTOR LANGE, *Chairman*

Division of Modern Languages, Mr. J M. COWAN, *Chairman*

Department of Romance Literature, Mr. MORRIS BISHOP, *Chairman*

### BURMESE

Mr. R. B. JONES, Jr., and STAFF.

\*101-102. *ELEMENTARY COURSE*. Throughout the year. Credit six hours a term. Hours to be arranged.

### CHINESE

Messrs. C. F. HOCKETT, H. E. SHADICK, and STAFF.

(For a major involving Chinese studies, see *Department of Far Eastern Studies*.)

\*101-102. *ELEMENTARY CHINESE*. Throughout the year. Credit six hours a term. T Th 9 and M T W Th F S 8.

\*103. *ELEMENTARY CHINESE*. Fall term. No credit. Open only to students who have failed the qualifying examination, taken at the end of Chinese 102. Hours to be arranged.

\*201. *INTRODUCTION TO CLASSICAL CHINESE*. Fall term. Credit three hours. Prerequisite, a satisfactory qualifying examination, or Chinese 103. M W F 11.

202. *INTERMEDIATE CHINESE*. Spring term. Credit three hours. Prerequisite, Chinese 201. M W F 11.

\*203. *INTERMEDIATE CHINESE*. Fall term. Credit three hours. Prerequisite, a satisfactory qualifying examination or Chinese 103. T Th S 11.

204. *INTERMEDIATE CHINESE*. Spring term. Credit three hours. Prerequisite, Chinese 203. T Th S 11.

231. *CHINESE DIALECTS OF SOUTHEAST ASIA*. Either term. May be repeated. Credit and hours as arranged. Prerequisite, consent of the instructor. Mr. HOCKETT and assistant.

Introduction to one of the important south Chinese dialects found in the South-east Asian area.

[232. *THE LINGUISTIC STRUCTURE OF CHINESE*. Spring term in alternate years. Credit three hours. Prerequisite, qualification in Chinese or Linguistics 201. Hours to be arranged. Mr. HOCKETT. Not offered in 1956-1957.]

*CHINESE HISTORICAL AND PHILOSOPHICAL LITERATURE IN TRANSLATION*. (See Literature 321.)

*CHINESE IMAGINATIVE LITERATURE IN TRANSLATION*. (See Literature 322.)

351-352. *READINGS IN CHINESE LITERATURE: CLASSICAL AND MODERN*. Throughout the year. Credit three hours a term. Prerequisite, Chinese 202 and 204.

### ENGLISH FOR FOREIGNERS

*The following two courses are offered by the Division of Modern Languages. Foreign students should consult a member of that division at Morrill Hall 108.*



\*102. *ENGLISH FOR FOREIGNERS*. Fall term. Credit six hours. Prerequisite, placement by the instructor. Hours to be arranged.

\*211. *ENGLISH FOR FOREIGNERS*. Fall term. Credit six hours. Prerequisite, a satisfactory qualifying examination. Hours to be arranged.

## FRENCH

Messrs. M. G. BISHOP, J. COLLIGNON, R. A. HALL, JR., B. L. RIDEOUT, R. C. WEINGARTNER, and STAFF.

*Students desiring to major in French may choose between two programs: (1) French Literature; (2) French Linguistics.*

*For a major in French Literature, consult Mr. BISHOP. The student must complete (1) twenty-one hours of courses numbered from 301 to 399 (except that 305-306 may not be counted). In this requirement Literature 329-330 and 331-332 may be counted, if the instructor attests that the reading and writing have been done, where possible, in French; (2) French 203, or proof of equivalent attainment in written and spoken French; (3) in related subjects, eighteen hours to be selected from Languages, Literatures, European History, Fine Arts, History of Music, History of Philosophy, and Dramatic Production.*

*Candidates for Honors in French Literature will take at least 27 hours of French Literature (courses numbered 301-399 and 010). Included in the required 27 hours will be at least nine hours in an Honors course. In addition, candidates for Honors will be supplied with a syllabus of reading, which will be the subject of a comprehensive examination at the end of their senior year.*

*Informal study (French 010) may be undertaken by majors in French Literature who have sixty credit hours, on the terms specified in the Introduction. The informal study may consist of additional work in connection with a course, or it may consist of reading and reports on an assigned subject.*

*For a major in French Linguistics, consult Mr. HALL. The following must be completed: (1) Linguistics 201-202; (2) French 204, 232, 233, 241, 242; (3) French Literature 301-302; (4) at least twelve hours in related subjects; (5) a comprehensive examination at the end of the senior year. For Honors in French Linguistics, the above five major requirements must be completed, except that requirement (4) shall consist of French 251-252 and 253-254. Honors candidates must have completed Linguistics 201-202 by the end of the sophomore year.*

\*101. *ELEMENTARY COURSE*. Either term. Credit six hours. Students who have previously studied any French must take the qualifying examination before registering for this course. Fall term, drill, M T W Th F S 8, 9, 10, 11, or 12 and lecture, M W 8, 10, or W F 12 or T Th 8. Spring term, drill, M T W Th F S 8, 9, 10, or 11 and lecture, M W 11 or T Th 9.

\*102. *ELEMENTARY COURSE*. Either term. Credit six hours. Prerequisite, French 101 or its equivalent. Students who have not completed French 101 (except those currently enrolled in French 101) must take the qualifying examination before registering for this course. Either term, drill, M T W Th F S 8, 9, 10, 11, or 12; and lecture: fall term, M W 11 or T Th 9 or 2; spring term, M W 8, 10. W F 12, or T Th 8.

\*103. *ELEMENTARY COURSE*. Either term. No credit. Open only to students who have failed the qualifying examination taken at the end of French 102. M W F 2 or T Th S 8.

151. *GRADUATE READING COURSE*. Either term. Credit three hours. Open only to graduate students. M W F 4:30 and/or 7 p.m.

152. *GRADUATE READING COURSE*. Either term. Credit three hours. Prerequisite, French 151 or one year of college French or two years of high school French. M W F 4:30 and/or 7 p.m.

\*201. *INTERMEDIATE READING COURSE*. Either term. Credit three hours. Prerequisite, a satisfactory qualifying examination or French 103. M W F 10, T Th S 10 or 12.

Reading of texts of established literary quality. The purpose of the course is double: to increase reading facility, knowledge of vocabulary and idiom; and to develop methods and habits of critical appreciation of a foreign literature. The class discussion is conducted mainly in French.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, a satisfactory qualifying examination or French 103. Fall term, M W F 2, T Th S 8 or 10. Spring term, M W F 9, 12 or 2, T Th S 8 or 9.

Guided conversation, grammar drill, and oral and written composition. Emphasis is placed upon increasing the student's oral and written command of French.

204. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, French 203. M W F 12.

Continuation of the work of French 203, with especial attention to accurate and idiomatic expression in French. Oral and written drill.

223. *ADVANCED COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, French 204. Hours to be arranged.

Study of stylistic resources of modern French, based on reading and analysis of a selected text. Discussion, oral and written drill.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, French 204. Hours to be arranged.

Study of stylistic resources of modern French, based on reading and analysis of a selected text. Discussion, oral and written drill.

[232. *THE LINGUISTIC STRUCTURE OF FRENCH*. Spring term 1958 and alternate years. Credit three hours. Prerequisite, qualification in French and Linguistics 201. Open only to juniors and seniors. M W F 2. Mr. HALL. Not offered in 1956-1957.]

[233. *OLD FRENCH TEXTS*. Fall term 1957 and alternate years. Credit three hours. Prerequisite, qualification in French. Open only to juniors and seniors. M W F 2. Mr. HALL. Not offered in 1956-1957.]

241-242. *HISTORY OF THE FRENCH LANGUAGE*. Throughout the year 1956-1957. and alternate years. Credit three hours a term. Prerequisite, qualification in French. Open only to juniors and seniors. M W F 2. Mr. HALL.

The development of French from Latin and Proto-Romance to the medieval language. The rise of the standard language; the Renaissance and modern language; analysis of changes in sound and forms. Lectures, discussion, reading and analysis of texts.

251-252. *HONORS WORK IN FRENCH LINGUISTICS*. Throughout the year. Credit three hours a term. To be taken in the junior year. Course 251 is normally prerequisite to course 252; in exceptional cases it may be taken concurrently with course 252 in the spring term. Hours to be arranged. Mr. HALL.

Selected readings in general linguistics and in the structure and history of French, with oral and written reports.

253-254. *HONORS THESIS IN FRENCH LINGUISTICS*. Throughout the year. Credit three hours a term. To be taken in the senior year. Mr. HALL.

The preparation of a thesis in French linguistics.

290. *SEMINAR IN FRENCH LINGUISTICS*. Offered in accordance with student needs. Credit three hours a term. Hours to be arranged. Mr. HALL.

\*301-302. *SURVEY OF FRENCH LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, French 201, or four years of entrance French, or consent of the instructor. The course may be entered in the second term. M W F 11. Mr. BISHOP.

Lectures in French and classroom discussion on French literature from the medieval period to the present. The ability to read French easily and to understand and speak French with some readiness is expected of the students.

[\*305. *FRENCH MASTERPIECES IN ENGLISH*. Not offered in 1956-1957.]

311-312. *LITERATURE OF THE SIXTEENTH CENTURY*. Throughout the year. Credit two hours a term. Prerequisite, French 301 or its equivalent. The course may be entered in the spring term. T Th 12. Mr. COLLIGNON.

The first term deals with the humanist writers of the early French Renaissance, particularly Rabelais. The second term treats chiefly of Montaigne and the writers of the Pléiade.

[313-314. *LITERATURE OF THE SEVENTEENTH CENTURY*. Not offered in 1956-1957.]

[315-316. *LITERATURE OF THE EIGHTEENTH CENTURY*. Not offered in 1956-1957.]

317-318. *LITERATURE OF THE EARLY NINETEENTH CENTURY*. Throughout the year. Credit three hours a term. Prerequisite, French 302 or its equivalent. The course may be entered in the second term. M W F 10. Mr. BISHOP.

Romanticism, its theory, development, and achievement. Extensive reading of the poets, novelists, and dramatists of the period.

[319-320. *LITERATURE OF THE LATE NINETEENTH CENTURY*. Not offered in 1956-1957.]

[321-322. *LITERATURE OF THE TWENTIETH CENTURY*. Not offered in 1956-1957.]

*CONTEMPORARY TENDENCIES IN FRENCH AND EUROPEAN LITERATURES* (Literature 329-330). Throughout the year. Credit three hours a term. M W F 9. Mr. COLLIGNON.

341-342. *HONORS WORK IN FRENCH LITERATURE*. Throughout the year. Credit three hours a term. The course may be entered in the second term. Hours to be arranged. Mr. COLLIGNON.

Open to candidates for Honors in French Literature, to graduate students, and to others with consent of the instructor. A literary, historic, and stylistic study of an important writer or literary movement.

[351. *FRENCH FOR TEACHERS*. Not offered in 1956-1957.]

375-376. *FRENCH SEMINAR*. Primarily for graduates. Throughout the year. Credit two hours a term. T 2-4, or another hour to be arranged. Mr. BISHOP.

An introduction to the methods and materials of research in French literature, by means of collective study of a problem in French literary history.

010. *INFORMAL STUDY*. Open to qualified students. Mr. BISHOP and Mr. COLLIGNON.

## GERMAN

Messrs. S. A. BROWN, J M. COWAN, V. LANGE, I. LORAM, W. G. MOULTON, and STAFF.

*Students desiring to major in German may choose among three programs of study: (1) German Literature; (2) German Linguistics; (3) German Studies.*

*For a major in German Literature consult Mr. LANGE. The following courses*

must be completed: (1) at least twenty-one hours of advanced courses in German Literature, including 305-306, or 301-302; (2) in related subjects, at least fifteen hours selected from the literatures, the Division of Modern Languages, the Classics, Ancient and European History, Philosophy. The student should consult his adviser for the planning of a coherent program.

For a major in German Studies consult Mr. LANGE. The following courses must be completed: (1) German 241; (2) German 303, 305-306 or 301-302, 365-366; (3) in related subjects History 425-426 and at least fifteen hours selected from the following: German 204, 232; History 323, 430; Literature 207, 402; Fine Arts 551, 554; Sociology 103, 411.

Candidates for the Honors programs in German Literature or German Studies will complete the requirements for the major in these fields and, in addition, take the prescribed Honors work 565-566 in the junior year and 575-576 in the senior year. The candidate for Honors will also take a comprehensive examination at the end of the last term of the senior year covering the whole field of major concentration.

For a major in German Linguistics consult Mr. MOULTON. The following must be completed: (1) Linguistics 201-202; (2) German 202, 204, 232, 241, 242; (3) German Literature 305-306; (4) at least twelve hours in related subjects; (5) a comprehensive examination at the end of the senior year.

For Honors in German Linguistics, the above five major requirements must be completed, except that requirement (4) shall consist of German 251-252 and 253-254. Honors candidates must have completed Linguistics 201-202 by the end of the sophomore year.

**\*101. ELEMENTARY COURSE.** Either term. Credit six hours. Students who have previously studied any German must take the qualifying examination before registering for this course. Fall term, drill, M T W Th F S 8, 9, 10, 11, or 12 and lecture, M W 9 or 11, or T Th 11 or 2. Spring term, drill M T W Th F S 8 or 9, and lecture, T Th 12.

**\*102. ELEMENTARY COURSE.** Either term. Credit six hours. Prerequisite, German 101 or its equivalent. Students who have not completed German 101 (except those currently enrolled in German 101) must take the qualifying examination before registering for this course. Fall term, drill, M T W Th F S 8 or 9 and lecture, T Th 12. Spring term, drill, M T W Th F S 8, 9, 10, 11, or 12 and lecture, M W 10 or 11, or T Th 9 or 2.

**\*103. ELEMENTARY COURSE.** Either term. No credit. Open only to students who have failed the qualifying examination taken at the end of German 102. T Th S 10.

**151. GRADUATE READING COURSE.** Either term. Credit three hours. Open only to graduate students. M W F 4:30 and/or 7 p.m.

**152. GRADUATE READING COURSE.** Either term. Credit three hours. Prerequisite, German 151 or one year of college German or two years of high school German. M W F 4:30 and/or 7 p.m.

**\*201. INTERMEDIATE READING COURSE.** Either term. Credit three hours. Prerequisite, qualification in German. M W F 11. Mr. LANGE and STAFF.

This course is intended to develop the skills necessary for the reading and interpretation of select types of significant writing in German. Emphasis will be placed on introducing the student to a variety of forms of expression, vocabularies, and styles.

**\*202. INTERMEDIATE READING COURSE.** Spring term only. Credit three hours. Prerequisite, German 201 or consent of the instructor. M W F 11. Mr. LANGE and STAFF.

This course will provide further training in the reading and interpretation of

significant literary texts in German. It may be offered in fulfilment of the distribution requirements in Modern Languages and the Humanities.

\*203-204. *COMPOSITION AND CONVERSATION*. Throughout the year. Credit three hours a term. Prerequisite, qualification in German. Course 203 is prerequisite to 204. T Th S 12.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, German 204. M W F 11.

Study of stylistic resources of modern German, based on reading and analysis of a selected text. Discussion, oral and written drill.

232. *LINGUISTIC STRUCTURE OF GERMAN*. Spring term 1957 and alternate years. Credit three hours. Prerequisites, qualification in German and Linguistics 201. Open only to juniors and seniors. T Th S 11. Mr. MOULTON.

A study of the sounds, forms, and structure of modern standard German, using recorded materials and a selected text.

[241-242. *HISTORY OF THE GERMAN LANGUAGE*. Throughout the year, 1957-1958 and alternate years. Credit three hours a term. Open only to juniors and seniors. T Th S 9. Mr. MOULTON. Not offered in 1956-1957.]

251-252. *HONORS WORK IN GERMAN LINGUISTICS*. Throughout the year. Credit three hours a term. To be taken in the junior year. Course 251 is normally prerequisite to course 252; in exceptional cases it may be taken concurrently with course 252 in the spring. Hours to be arranged. Mr. MOULTON.

Selected readings in general linguistics and in the structure and history of German, with oral and written reports.

253-254. *HONORS THESIS IN GERMAN LINGUISTICS*. Throughout the year. Credit three hours a term. To be taken in the senior year. Mr. MOULTON.

The preparation of a thesis in German Linguistics.

[281-282. *GOTHIC AND COMPARATIVE GERMAN LINGUISTICS*. Throughout the year 1957-1958 and alternate years. Credit three hours a term. For graduate students. T Th S 11. Mr. MOULTON. Not offered in 1956-1957.]

283-284. *OLD SAXON AND OLD HIGH GERMAN*. Throughout the year 1956-1957 and alternate years. Credit three hours a term. For graduate students. T Th S 9. Mr. MOULTON.

Analysis of the language of the Low German *Heliand* and of the earliest High German documents.

290. *SEMINAR IN GERMAN LINGUISTICS*. Offered in accordance with student needs. Hours and credits to be arranged.

\*301-302. *MASTERS OF GERMAN LITERATURE*. Throughout the year. Credit three hours a term. Open to all students. A knowledge of German is not required. Lectures and reading in English. M W F 2. Mr. LANGE.

This course will deal with the main representatives of German literature and thought from Luther to the present. The first term will be devoted to the period before 1850, the second to the century from 1850 to the present.

\*303. *ASPECTS OF GERMAN CULTURE*. Fall term. Credit three hours. Lectures and reading in English. A knowledge of German is not required. M W F 12. Mr. \_\_\_\_\_.

This course will deal with the social structure of Germany, the evolution of its institutions, and its achievements in the various fields of art.

[\*305-306. *SURVEY OF GERMAN LITERATURE*. Throughout the year. Credit



three hours a term. Either term may be taken independently of the other. M W F 11. Mr. LORAM. Offered in alternate years. Not offered in 1956-1957.]

[309. *MIDDLE HIGH GERMAN LITERATURE*. Fall term. Credit three hours. Mr. LORAM. Not offered in 1956-1957.]

[310. *GERMAN REFORMATION AND BAROQUE*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Mr. ———. Not offered in 1956-1957.]

315. *GERMAN POETRY OF THE CLASSICAL PERIOD*. Fall term. Credit three hours. M W F 10. Mr. LORAM.

[316. *MODERN GERMAN POETRY*. Spring term. Credit three hours. M W F 2. Mr. LANGE. Not offered in 1956-1957.]

317. *GERMAN PROSE FICTION FROM GOETHE TO THOMAS MANN*. Spring term. Credit three hours. M W F 10. Mr. LORAM.

326. *GERMAN DRAMA OF THE NINETEENTH AND TWENTIETH CENTURY*. Spring term. Credit three hours. M W F 9. Mr. ———.

[332. *MODERN GERMAN LITERATURE 1870-1950*. Fall term. Credit three hours. M W F 2. Mr. LANGE. Not offered in 1956-1957.]

[345. *LESSING AND THE PERIOD OF ENLIGHTENMENT*. Spring term. Credit three hours. M W F 12. Mr. LANGE. Not offered in 1956-1957.]

[350. *SCHILLER*. Fall term. Credit three hours. M W F 2. Mr. LORAM. Not offered in 1956-1957.]

[365-366. *GOETHE*. Throughout the year. Credit three hours a term. M W F 9. Mr. LANGE. Not offered in 1956-1957.]

420. *GERMAN ROMANTICISM*. Fall term. Credit three hours. M W F 2. Mr. ———.

475-476. *SEMINAR IN GERMAN LITERATURE*. Throughout the year. Credit three hours a term. One meeting a week to be arranged. Fall term: *German Baroque Poetry*; spring term: *Goethe-Schiller Correspondence*. Mr. LANGE.

565-566. *HONORS WORK IN GERMAN LITERATURE AND GERMAN STUDIES*. Throughout the year. Credit three hours a term. Hours to be arranged. The STAFF.

Open only to candidates for Honors in the junior year. The course will consist of special readings and reports in the field of concentration.

575-576. *HONORS WORK IN GERMAN LITERATURE AND GERMAN STUDIES*. Throughout the year. Credit three hours a term. Hours to be arranged. The STAFF.

Open only to candidates for Honors in the senior year. The course will consist of the preparation of a senior thesis of suitable length on an approved subject in the field of concentration and of the preparation for the comprehensive examinations to be given to the Honors candidates at the end of their final term.

080. *INFORMAL STUDY*. Open to qualified juniors and seniors. Mr. LORAM.

090. *INFORMAL STUDY*. Open to qualified juniors and seniors. Mr. LANGE.

## HINDI

\*101-102. *ELEMENTARY COURSE*. Throughout the year. Credit six hours a term. M T W Th F S 10 and T Th 2.

201-202. *HINDI READING*. Throughout the year. Credit three hours a term. Prerequisite for 201, qualification in Hindi; for 202, course 201 or consent of the instructor. Hours to be arranged.



## INDONESIAN

Mr. J. M. ECHOLS and STAFF.

\*101-102. *ELEMENTARY COURSE*. Throughout the year. Credit six hours a term. M T W Th F S 9 and two hours to be arranged.

201-202. *INDONESIAN READING*. Throughout the year. Credit three hours a term. Prerequisite for 201, qualification in Indonesian; for 202, course 201 or consent of the instructor. Hours to be arranged. Mr. ECHOLS.

203-204. *COMPOSITION AND CONVERSATION*. Throughout the year. Credit three hours a term. Prerequisite for 203, qualification in Indonesian; for 204, course 203 or consent of the instructor. Hours to be arranged. Mr. ECHOLS.

## ITALIAN

Messrs. M. G. BISHOP, R. A. HALL, Jr., and STAFF.

\*101-102. *ELEMENTARY COURSE*. Throughout the year. Credit six hours a term. Fall term, T Th 10 and M T W Th F S 8, 9, 11, or 12. Spring term, T Th 10, and M T W Th F S 8, 9, or 11.

\*103. *ELEMENTARY COURSE*. Either term as required. No credit. Open only to students who have failed the qualifying examination, taken at the end of Italian 102. Hours to be arranged.

\*201. *INTERMEDIATE READING COURSE*. Fall term. Credit three hours. Prerequisite, a satisfactory qualifying examination or Italian 103. Hours to be arranged.

Reading of modern Italian texts with emphasis upon the development of vocabulary, knowledge of idioms, and facility in reading. Class discussion of each day's readings.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, a satisfactory qualifying examination or Italian 103. Hours to be arranged.

Guided conversation, grammar drill, and oral and written composition. Emphasis is placed on increasing the student's oral and written command of Italian.

204. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Italian 203. Hours to be arranged.

Continuation of the work of Italian 203, with especial attention to accurate and idiomatic expression in Italian. Oral and written drill.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Given as required. Credit two to four hours. Prerequisite, Italian 204. Hours to be arranged.

290. *SEMINAR IN ITALIAN LINGUISTICS*. Offered in accordance with student needs. Credit three hours a term. Hours to be arranged. Mr. HALL.

[301-302. *DANTE*. Not offered in 1956-1957. Students interested in reading Dante in Italian may arrange to do so by taking Literature 211, Survey of Medieval Literature, after consultation with the instructor.]

[307-308. *SURVEY OF ITALIAN LITERATURE*. Not offered in 1956-1957.]

[315-316. *LITERATURE OF THE TWENTIETH CENTURY*. Not offered in 1956-1957.]

010. *INFORMAL STUDY*. May be undertaken by qualified juniors and seniors. Mr. BISHOP and Mr. HALL.

## LINGUISTICS

Messrs. F. B. AGARD, J. M. COWAN, J. M. ECHOLS, G. H. FAIRBANKS, R. A. HALL, JR., C. F. HOCKETT, W. G. MOULTON.

201-202. *INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE*. Throughout the year. Credit three hours a term. M W F 9. Mr. MOULTON.

A basic introductory course designed to acquaint the student with the methods of systematic observation of language phenomena (linguistics). This course is required for all majors in French, German, Spanish, or Slavic linguistics; it is also a prerequisite, or a concurrent requirement, for Linguistic Analysis 203-204.

203-204. *LINGUISTIC ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisite, Linguistics 201. M W F 10. Mr. HOCKETT.

A training course in the techniques of observation and analysis of descriptive linguistics. Fall term: phonetics and phonemics. Spring term: morphology and syntax.

205. *FIELD METHODS*. Fall term. Credit three hours. Prerequisite, Linguistics 204. Hours to be arranged; four class or laboratory hours a week may be required. Mr. HOCKETT.

A language with which the students have had no previous experience will be analyzed, on the basis of data gathered in class directly from an informant. The psychological, cultural, and linguistic problems of field methods will be discussed as they arise.

211-212. *ACOUSTICAL PHONETICS*. Throughout the year. Credit three hours a term. Prerequisite: consent of the instructor. Hours to be arranged. Mr. COWAN.

A rapid survey of the techniques of experimental articulatory phonetics; the speech mechanism as a sound generator; sound recording techniques, and the methods of general acoustics; application of acoustical analysis to the study of speech sounds. The course will require no mathematical training of the students beyond arithmetical computation; the necessary mathematical operations for acoustical analysis will be developed for the students by the instructor.

[281-282. *THE COMPARATIVE STUDY OF THE ROMANCE LANGUAGES*. Throughout the year, 1957-1958 and alternate years. Credit three hours a term. Prerequisite, Linguistics 201-202, taken previously or concurrently. Hours to be arranged. Mr. HALL. Not offered in 1956-1957.]

283. *ELEMENTARY SANSKRIT*. Fall term 1956 and alternate years. Credit three hours. Prerequisite, advanced standing. Hours to be arranged. Mr. FAIRBANKS.

Introduction to the sounds and forms of Sanskrit; readings in Sanskrit.

284. *COMPARATIVE METHODOLOGY*. Spring term 1957 and alternate years. Credit three hours. Prerequisite, Linguistics 201-202 or equivalent. Hours to be arranged. Mr. FAIRBANKS.

A study of the methods and techniques in comparative linguistics; application of these methods to various language families depending on the student's background.

290. *SEMINAR*. Each term. Admission by permission of the instructor. Hours and credits to be arranged. Various members of the staff.

## PORTUGUESE

Mr. F. B. AGARD.

111-112. *ELEMENTARY COURSE*. Throughout the year. Credit three hours a term. May not be offered in fulfillment of common studies requirements. Prerequisite, consent of the instructor. T Th 2-3:15.

A basic course designed principally for students majoring in Spanish or interested specially in Portugal or Brazil. Phonology, grammar, listening comprehension, and reading.

## RUSSIAN

Messrs. G. H. FAIRBANKS, V. NABOKOV, and STAFF.

*For a major in Russian Linguistics, consult Mr. FAIRBANKS. The following must be completed: (1) Linguistics 201-202; (2) Russian 201, 202, 203, 204, 232, 241; (3) six hours of Russian Literature; (4) at least twelve hours in related subjects; (5) a comprehensive examination at the end of the senior year. For Honors in Russian Linguistics, the above five major requirements must be completed, except that requirement (4) shall consist of Russian 251-252 and 253-254. Honors candidates must have completed Linguistics 201-202 by the end of the sophomore year.*

\*101-102. *ELEMENTARY COURSE.* Throughout the year. Credit six hours a term. Drill, M T W Th F S 9, 10, or 12 and lecture, T Th 11.

\*103. *ELEMENTARY COURSE.* Either term. No credit. Open only to students who have failed the qualifying examination taken at the end of Russian 102. Hours to be arranged.

\*201. *INTERMEDIATE READING COURSE.* Fall term. Credit three hours. Prerequisite, a satisfactory qualifying examination or Russian 103. M W F 10.

202. *INTERMEDIATE READING COURSE.* Spring term. Credit three hours. Prerequisite, Russian 201. M W F 10.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION.* Fall term. Credit three hours. Prerequisite, Russian 201 or concurrent registration in Russian 201. M W F 12 and two hours to be arranged.

204. *INTERMEDIATE COMPOSITION AND CONVERSATION.* Spring term. Credit three hours. Prerequisite, Russian 202 or concurrent registration in Russian 202. M W F 12 and two hours to be arranged.

223. *ADVANCED COMPOSITION AND CONVERSATION.* Fall term. Credit three hours. Prerequisite, Russian 204. Hours to be arranged.

224. *ADVANCED COMPOSITION AND CONVERSATION.* Spring term. Credit three hours. Prerequisite, Russian 223. Hours to be arranged.

225. *ADVANCED READINGS.* Either term. Credit three hours. Prerequisite, Russian 202. Hours to be arranged.

[232. *THE LINGUISTIC STRUCTURE OF RUSSIAN.* Spring term 1958 and alternate years. Credit three hours. Prerequisite, qualification in Russian and Linguistics 201. M W F 2. Mr. FAIRBANKS. Not offered in 1956-1957.]

[241. *HISTORY OF THE RUSSIAN LANGUAGE.* Fall term 1957 and alternate years. Credit three hours. Prerequisite, qualification in Russian. M W F 2. Mr. FAIRBANKS. Not offered in 1956-1957.]

251-252. *HONORS WORK IN RUSSIAN LINGUISTICS.* Throughout the year. Credit three hours a term. To be taken in the junior year. Course 251 is normally prerequisite to course 252; in exceptional cases it may be taken concurrently with course 252 in the spring. Hours to be arranged. Mr. FAIRBANKS.

Selected readings in general linguistics and in the structure and history of Russian, with oral and written reports.

253-254. *HONORS THESIS IN RUSSIAN LINGUISTICS.* Throughout the year. Credit three hours a term. To be taken in the senior year. Mr. FAIRBANKS.

The preparation of a thesis in Russian Linguistics.

281. *OLD BULGARIAN*. Fall term 1956 and alternate years. Credit three hours. Prerequisite, qualification in Russian and Linguistics 201. Hours to be arranged. Mr. FAIRBANKS.

Descriptive analysis of the phonology and morphology of the language; readings in Old Bulgarian texts.

282. *OLD RUSSIAN*. Spring term 1957 and alternate years. Credit three hours. Prerequisite, qualification in Russian and Linguistics 201. Hours to be arranged. Mr. FAIRBANKS.

Descriptive analysis of the phonology and morphology of Old Russian texts with the aim of studying the development of the language.

[283-284. *COMPARATIVE SLAVIC LINGUISTICS*. Throughout the year 1957-58 and alternate years. Credit three hours a term. Prerequisite, Russian 241. Hours to be arranged. Mr. FAIRBANKS. Not offered in 1956-1957.]

290. *SEMINAR IN SLAVIC LINGUISTICS*. Offered in accordance with student needs. Credit three hours a term. Hours to be arranged. Mr. FAIRBANKS.

[315-316. *PUSHKIN*. Not offered in 1956-1957.]

317-318. *THE MODERNIST MOVEMENT IN RUSSIAN LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, a ready reading knowledge of Russian. Hours to be arranged. Mr. NABOKOV.

A study of the poetry and prose of the Modernist movement, from its source to our own time.

325-326. *RUSSIAN LITERATURE IN TRANSLATION*. Throughout the year. Credit three hours a term. M W F 11. Mr. NABOKOV.

For description see Literature, under which heading registration should be made.

## SPANISH

MESSRS. F. B. AGARD, D. BRENES, D. F. SOLA, and STAFF.

*Students desiring to major in Spanish may choose between two programs: (1) Spanish Literature; (2) Spanish Linguistics.*

*For a major in Spanish Literature, consult Mr. BRENES. The student must complete (1) twenty-one hours of courses numbered from 301 to 399; (2) Spanish 203, or proof of equivalent attainment in writing and speaking Spanish; (3) in related subjects, eighteen hours to be selected from Languages, Literatures, European History, Fine Arts, History of Music, History of Philosophy, and Dramatic Production.*

*Informal study (Spanish 010) may be undertaken by majors in Spanish Literature who have sixty credit hours, on the terms specified in the Introduction.*

*For a major in Spanish Linguistics, consult Mr. AGARD. The following must be completed: (1) Linguistics 201 and 202; (2) Spanish 204, 224, 232, 241, and 242; (3) Spanish Literature 301-302 or 303-304; (4) at least twelve hours in related subjects; (5) a comprehensive examination at the end of the senior year.*

*For Honors in Spanish Linguistics, the above major requirements must be completed, except that requirement (4) shall consist of Spanish 251-252 and 253-254. Honors candidates must have completed Linguistics 201-202 by the end of the sophomore year.*

\*101. *ELEMENTARY COURSE*. Either term. Credit six hours. Students who have previously studied any Spanish must take the qualifying examination before registering for this course. Fall term, drill, M T W Th F S 8, 9, 10, 11, or 12 and lecture, M W 2 or T Th 9 or 12. Spring term, drill, M T W Th F S 8 or 12 and lecture, M W 9 or T Th 10.

\*102. *ELEMENTARY COURSE*. Either term. Credit six hours. Prerequisite, Spanish 101 or its equivalent. Students who have not completed Spanish 101 (except those currently enrolled in Spanish 101) must take the qualifying examination before registering for this course. Fall term, drill, M T W Th F S 8, 9, 11, or 12 and lecture, W F 12 or T Th 10. Spring term, drill, M T W Th F S 8, 9, 10, or 11 and lecture, T Th 11 or W F 12 or T Th 12.

\*103. *ELEMENTARY COURSE*. Either term. No credit. Open only to students who have failed the qualifying examination taken at the end of Spanish 102. T Th S 9.

\*201. *INTERMEDIATE READING COURSE*. Either term. Credit three hours. Prerequisite, qualification in Spanish, or Spanish 103. T Th S 9.

Reading of texts of established literary quality. The purpose of the course is double: to increase reading facility and knowledge of vocabulary and idiom; and to develop methods and habits of critical appreciation of foreign literature. The class discussion is conducted mainly in Spanish.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, a satisfactory qualifying examination, or Spanish 103. M W F 11, T Th S 11.

Guided conversation, grammar review, and oral and written composition. Emphasis is on increasing student's oral and written command of Spanish.

204. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, Spanish 203. M W F 2.

Continuation of the work in Spanish 203, with special attention to accurate and idiomatic expression in Spanish, both oral and written.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Spanish 204. T Th S 11.

Continuation of the work of Spanish 204, with discussion directed toward Latin-American culture and institutions.

[232. *THE LINGUISTIC STRUCTURE OF SPANISH*. Spring term 1958 and alternate years. Credit three hours. Prerequisite, qualification in Spanish and Linguistics 201. Open only to juniors and seniors. M W F 2. Mr. AGARD. Not offered in 1956-1957.]

241-242. *HISTORY OF THE SPANISH LANGUAGE*. Throughout the year, 1956-1957 and alternate years. Credit three hours a term. Prerequisite, qualification in Spanish. Open only to juniors and seniors. M W F 2. Mr. AGARD.

The development of Spanish from Latin and Proto-Romance to the medieval language. The rise of the standard language; the Renaissance and modern language; analysis of changes in sounds and forms. Lectures, discussion, reading, and analysis of texts.

251-252. *HONORS WORK IN SPANISH LINGUISTICS*. Throughout the year. Credit three hours a term. To be taken in the junior year. Course 251 is normally prerequisite to course 252; in exceptional cases it may be taken concurrently with course 252 in the spring. Hours to be arranged. Mr. AGARD.

Selected readings in general linguistics and in the structure and history of Spanish, with oral and written reports.

253-254. *HONORS THESIS IN SPANISH LINGUISTICS*. Throughout the year. Credit three hours a term. To be taken in the senior year. Mr. AGARD.

The preparation of a thesis in Spanish Linguistics.

290. *SEMINAR IN IBERO-ROMANCE LINGUISTICS*. Offered in accordance with student needs. Credit three hours a term. Hours to be arranged. Mr. AGARD.



\*301-302. *SURVEY OF SPANISH LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, Spanish 201, or four years of entrance Spanish, or consent of the instructor. The course may be entered in the second term. M W F 11. Mr. BRENES.

Lectures in Spanish and classroom discussion on Spanish literature from the Middle Ages to the present.

[\*303-304. *SURVEY OF SPANISH-AMERICAN LITERATURE*. Not offered in 1956-1957.]

[311-312. *CERVANTES*. Not offered in 1956-1957.]

313-314. *LITERATURE OF THE GOLDEN AGE*. Throughout the year. Credit three hours a term. Prerequisite, Spanish 301-302 or consent of the instructor. The course may be entered in the second term. Hours to be arranged. Mr. BRENES.

The course supplements the treatment of the Golden Age given in Spanish 301-302. The rich dramatic production, the non-picaresque novel, the short story of the Golden Age are read and discussed. Particular attention is paid to Cervantes, Lope de Vega, Tirso, and Calderón.

387-388. *SEMINAR IN SPANISH LITERATURE*. Throughout the year. Credit two hours a term. Hours to be arranged. Mr. BRENES.

For graduates and qualified undergraduates. The study of a problem or restricted subject in Spanish literature.

010. *INFORMAL STUDY*. Open to qualified juniors and seniors. Mr. BRENES.

### THAI (SIAMESE)

Mr. R. B. JONES, JR., and STAFF.

\*101-102. *ELEMENTARY COURSE*. Throughout the year. Credit six hours a term. Hours to be arranged.

### VIETNAMESE (ANNAMESE)

Mr. R. B. JONES, JR., and STAFF.

\*101-102. *ELEMENTARY COURSE*. Throughout the year. Credit six hours a term. Hours to be arranged.

### MUSIC

Mr. DONALD J. GROUT, *Chairman*; Messrs. WILLIAM AUSTIN, WILLIAM CAMPBELL, KEITH FALKNER, JOHN HSU, ROBERT HULL, KAREL HUSA, JOHN KIRKPATRICK, JAMES MING, ROBERT PALMER, HENRY ROMERSA, IVAN WALDBAUER.

*For a major in Music, the requirements are: (1) (a) Music 101-102 (for 102, either 110 or 112 may be substituted); (b) Music 201-202, 203-204, 301-302, and six hours from Music 303 through 312; (c) three hours in Music 401-402, and Music 211 (unless proficiency in conducting is demonstrated); (2) Music 107-108, until proficiency in basic musicianship is demonstrated by passing an examination, which will be given by the faculty of the Department at times to be announced; (3) at least two years' membership and participation in one of the musical organizations (see Music 403-412).*

*Candidates for Honors in Music will be designated by the Department at the beginning of the second term of their junior year. Honors candidates will take Music 351-352 in addition to the courses regularly required for a major. Each candidate will submit an Honors thesis or a composition not later than April 25 of his senior*

year and will be required to pass a general examination in the theory and history of music not later than May 25 of his senior year.

Students who are considering Music as a possible major field should consult the Chairman of the Department at the beginning of their freshman year or as soon thereafter as possible.

A large collection of recorded music and scores is housed in the Music Building at 320 Wait Avenue, where a number of phonograph listening rooms are available. These facilities may be used by any member of the student body at hours to be announced each term.

Choral and instrumental ensembles are trained and directed by members of the departmental staff each term, and all students who are interested are invited to join one or more of these groups. These ensembles include the Sage Chapel Choir, the Cornell A Cappella Chorus, the Bands (Concert Band, Big Red Band, Repertory Band), the University Orchestra, and Chamber Music groups. For rehearsal hours and conditions for academic credit, see Music 403 through 412. Announcements of tryouts for all organizations will be made at the beginning of the fall term.

The various designations of Informal Study, besides serving the purpose of individual work for properly qualified students, may also embrace ensemble projects in vocal or instrumental music that involves serious study of a literature.

## MUSIC THEORY

**\*103. INTRODUCTION TO MUSIC THEORY.** Either term. Credit three hours a term. Fall term, M through F 9. Spring term, M through F 10. Mr. CAMPBELL.

Designed for the general student with limited knowledge of the rudiments of music. Some ability to play an instrument is desirable. Fundamentally an ear training course emphasizing intervals, scales, triads, and keys; rhythmic, melodic, and harmonic dictation; sight singing; writing of melody and simple four-part texture; analysis and keyboard harmony.

**\*104. INTRODUCTION TO MUSIC THEORY.** Spring term. Credit three hours. Prerequisite, Music 103. M through F 9. Mr. CAMPBELL.

A continuation of Music 103.

**\*105-106. THEORY I: THE FUNDAMENTALS OF MUSIC.** Throughout the year. Credit three hours a term. A knowledge of the rudiments of music and some ability to play an instrument are required. Music 107-108 should be taken concurrently. First term prerequisite to second. M through F 9. Mr. HUSA.

Designed for music majors and qualified general students. Includes the content of 103-104 on a higher level and elementary composition in instrumental style.

**\*107-108. BASIC MUSICIANSHIP.** Throughout the year. Without credit. Scheduled in three sections in coordination with Theory I, II, and III: I, M W 2 and Th 3; II, M W Th 3; III, M W F 12. Mr. WALDBAUER.

Aural discrimination, sight singing, keyboard harmony and sight reading, melodic and harmonic dictation, score reading. The purpose of this course is to assist students to develop, in connection with and supplementary to their other courses (whether in Theory, History, or Applied Music), the powers of aural perception and imagination needed for full comprehension of a work of music. The class will be divided into sections on the basis of ability and instruction adapted as closely as possible to individual needs.

**\*201-202. THEORY II: HARMONY.** Throughout the year. Credit three hours a term. Prerequisite, Music 105-106 or the equivalent. Music 107-108 should be taken concurrently. First term prerequisite to second. M W F 10 and Th 2. Mr. HUSA.

A study of harmonic principles of the period of common practice (1700-1900). The materials and techniques of the period will be practiced through writing, hear-

ing, analysis, playing, and composition in the simpler homophonic forms. Advanced dictation, sight singing, and keyboard harmony.

203-204. *THEORY III: COUNTERPOINT*. Throughout the year. Credit three hours a term. Prerequisite, Music 201-202, or the equivalent. Music 107-108 should be taken concurrently. First term prerequisite to second. M W F 10. Th 3. Mr. PALMER.

The general principles of counterpoint will be studied by examining the contrapuntal practice of the Baroque period as exemplified chiefly in the works of J. S. Bach. There will be analysis and composition in the polyphonic forms of the period.

[205-206. *THEORY IV: COMPOSITION IN TWENTIETH CENTURY STYLE*. Throughout the year. Credit two hours a term. Hours to be arranged. Prerequisite, Music 203-204 (which may be taken concurrently with Music 205-206). Mr. HUSA. Not offered in 1956-1957.]

207-208. *ORCHESTRATION*. Throughout the year. Credit two hours a term. Prerequisites, Music 101-102 and 105-106 or the equivalents. First term prerequisite to second. M W 2. Mr. HUSA.

A study of the instruments of the orchestra and their use in representative works from 1700 to the present. Scoring for various instrumental groups, including large orchestra.

211. *CONDUCTING*. Fall term. Credit two hours. Prerequisites, Music 101-102 and 105-106 or the equivalents. T Th 2. Mr. HULL.

The fundamentals of score reading and conducting. Qualified students will be given the opportunity to practice with University musical organizations.

277-278. *ANALYTIC TECHNIQUE*. Throughout the year. Credit three hours a term. Prerequisite, Music 203-204 or the equivalent (Music 203-204 may be taken concurrently). M W 2-4. Mr. PALMER.

This course is designed to develop a technique of analysis applicable to the music of any period. Examples from various periods in the history of music will be intensively studied, and the growth of the important structural principles underlying Western music will be traced.

021-022. *INFORMAL STUDY*. Credit hours to be arranged. Mr. PALMER.

351-352. *HONORS WORK IN MUSIC*. Credit three hours a term. Open only to Honors candidates in their senior year. Mr. GROUT and members of the Department.

## MUSIC HISTORY

\*101-102. *THE ART OF MUSIC*. Throughout the year. Credit three hours a term. Open to all students; first term prerequisite to the second, or consent of the instructor. Fall term, T Th 11 and recitation sections to be arranged. Spring term, T Th S 11. Mr. AUSTIN.

An approach to the understanding and rational enjoyment of the art of music, offered especially for students who have had little or no technical training in the subject. Students who are considering music as a possible major field should register for this course in their freshman year. The first term covers a study of the elements of music, media of musical expression, and musical forms. The second term covers a study of the work of representative composers in relation to their social and artistic environment. Most of the outside work in this course consists of attending concerts and studying phonograph records.

[\*110. *THE GREAT TRADITION IN MUSIC*. Spring term. Credit three hours. Prerequisite, Music 101. Enrollment limited, instructor's consent required. T Th S 11. Mr. GROUT. Not offered in 1956-1957.]

\*112. *PIANO MUSIC*. Spring term. Credit three hours. Prerequisite, Music 101. Enrollment limited, instructor's consent required. T Th S 11. Mr. KIRKPATRICK.

A survey of the literatures of the piano and its forerunners, emphasizing the relation of keyboard styles to the changing musical scene.

301-302. *HISTORY OF MUSIC*. Throughout the year. Credit three hours a term. Prerequisites, Music 101-102 and Music 201-202; the latter may be taken concurrently with Music 301-302. T Th S 9. Mr. GROUT.

The development of the art of music from the Middle Ages to the present, with a study of compositions representative of the principal styles.

[303-304. *MUSIC OF THE RENAISSANCE*. Throughout the year. Credit three hours a term. Prerequisites, Music 201-202 and 301-302. First term prerequisite to second. T Th S 11. Mr. GROUT. Not offered in 1956-1957.]

305-306. *MUSIC OF THE BAROQUE PERIOD*. Throughout the year. Credit three hours a term. Prerequisites, Music 201-202 and 301-302. T Th S 9. Mr. AUSTIN.

Styles, forms, and functions of music during the seventeenth and early eighteenth centuries.

[307-308. *MUSIC OF THE CLASSICAL PERIOD*. Throughout the year. Credit three hours a term. Prerequisites, Music 201-202 and 301-302. M W F 10. Mr. GROUT. Not offered in 1956-1957.]

[311-312. *CONTEMPORARY MUSIC*. Throughout the year. Credit three hours a term. Prerequisites, Music 301-302 and Music 203-204; the latter may be taken concurrently with Music 311-312. M W F 11. Mr. PALMER. Not offered in 1956-1957.]

031-032. *INFORMAL STUDY*. Credit hours to be arranged. Mr. AUSTIN.

033-034. *INFORMAL STUDY*. Credit hours to be arranged. Mr. GROUT.

043-044. *INFORMAL STUDY*. Credit hours to be arranged. Mr. FALKNER.

### APPLIED MUSIC

\*401-402. *INDIVIDUAL INSTRUCTION IN VOICE, ORGAN, PIANO, STRING, WOODWIND, AND BRASS INSTRUMENTS*. Throughout the year. For credit, see below. Consent of the instructor required.

Basic fees for one-half hour lesson weekly during one term (carrying no credit): \$60 for voice with Mr. FALKNER, and for piano with Mr. KIRKPATRICK; \$40 for organ with Mr. AUSTIN, for piano with Mr. WALDBAUER, for violin or viola with Mr. HULL, for woodwind or brass instruments with Mr. CAMPBELL or Mr. ROMERSA. Basic fees for a practice schedule of six hours weekly during one term: \$30 for the use of a pipe organ in Bailey Hall, Sage Chapel, or Barnes Hall; \$10 for a practice room with piano; \$5 for a practice room without piano. For double the time, these basic fees are doubled.

For credit: one hour lesson weekly (or two half-hours) and a double practice schedule carry three hours of credit for two terms, provided that the student shall have earned at least an equal amount of credit in courses in Music History or Music Theory, and in addition shall have demonstrated satisfactory proficiency or progress in basic musicianship, as determined jointly by his teacher and the instructor in Music 107-108. (Students should register in Music 401-402 for one hour's credit the first term and two hours' credit the second term.) The basic fees involved are then multiplied by one and a half (lesson fees: \$90 instead of \$120; \$60 instead of \$80; practice fees: \$45, \$15, and \$7.50). A student may register for this course in successive years.

## MUSICAL ORGANIZATIONS AND ENSEMBLES

Throughout the year. Credit one hour a term. Consent of instructor required. Registration is permitted in two of these courses simultaneously, and students may register in successive years, but no student may earn more than six hours of credit in these courses.

\*403-404. *ENSEMBLE*. F 2-5, and additional rehearsal hours as arranged. STAFF.

\*405-406. *THE SAGE CHAPEL CHOIR*. T 7:15-8:15 p.m. and Th 7:30-9 p.m. Mr. KIRKPATRICK.

\*407-408. *THE CORNELL A CAPPELLA CHORUS*. M W and alternate F 4:30-5:40 p.m. Mr. HULL.

\*409-410. *UNIVERSITY ORCHESTRA*. W 7:30-10 p.m., full orchestra; alternate T 7:30-9, sectional rehearsals. Mr. HULL.

\*411-412. *UNIVERSITY CONCERT BAND*. Th 7:30-9:30 p.m. F 4:30-6 p.m., and additional rehearsal hours to be arranged. Mr. CAMPBELL.

## COURSES PRIMARILY FOR GRADUATES

275-276. *SEMINAR IN COMPOSITION*. Throughout the year. Credit two hours a term. Open to seniors by permission. T 9-11. Mr. PALMER.

The work is intended to make the student acquainted with compositional practices in contemporary styles and to develop the student's creative abilities.

375-376. *INTRODUCTION TO RESEARCH*. Throughout the year. Credit two hours a term. Prerequisites, a reading knowledge of French or German and an elementary knowledge of music theory and general music history. Open to seniors by permission. M 10-12. Mr. AUSTIN.

The basic materials and techniques of musicological research.

377-378. *SEMINAR IN MUSICOLOGY*. Throughout the year. Credit two hours a term. W 10-12. Mr. GROUT.

This course is primarily for graduates (and, by permission, seniors) who have (1) the requisite knowledge of one or more of the important foreign languages, (2) a fair knowledge of music theory, and (3) some skill in applied music and score reading.

## PHILOSOPHY

Mr. STUART, M. BROWN, Jr., *Chairman*; MESSRS. ROGERS ALBRITTON, MAX BLACK, E. A. BURTT, RICHARD G. HENSON, JOHN H. HICK, NORMAN MALCOLM, JOHN RAWLS, DAVID SACHS, IRVING SINGER, HAROLD R. SMART.

*For a major in Philosophy, the standard requirement is as follows: (1) in Philosophy twenty-four hours, which must include the following: Philosophy 301-302, two additional related courses numbered above 200, and at least three hours of courses numbered above 400; (2) in related subjects, eighteen hours, to be chosen with the approval of the adviser. Informal study is open to qualified majors.*

*Students, with a major in Philosophy, entering the Cornell Law School or Medical College at the end of the junior year, are required to complete fifteen hours of Philosophy, including Philosophy 301-302, and two additional related courses numbered above 200.*

*Students who wish to graduate with Honors in Philosophy should consult the Chairman at the beginning of the junior year. For provisional acceptance as a candidate for Honors, a student will be required to have chosen a Philosophy major, to*



have a cumulative average of 80 for all work in the College, and an average of 85 for courses in Philosophy. An Honors candidate must take Philosophy 600-602 in his junior and senior years. He will be required to write a senior thesis and pass a comprehensive examination at the end of his senior year.

\*101. *PHILOSOPHICAL CLASSICS*. Either term. Credit three hours. Open to freshmen. Fall term, M W F 9 and 10; T Th S 9, 10, and 12. Spring term, M W F 9; T Th S 10 and 11. Registration is limited to 35 students a section. Messrs. HENSON, HICK, MALCOLM, RAWLS, SACHS, SINGER, and SMART.

A study of several Socratic dialogues, Plato's *Republic*, and J. S. Mill's *Utilitarianism* and *On Liberty*.

\*102. *PHILOSOPHICAL CLASSICS: SECOND COURSE*. Either term. Credit three hours. Prerequisite, Philosophy 101. Fall term, M W F 9 and 12. Spring term, M W F 10; T Th S 12. Registration is limited to 35 students a section. Messrs. ALBRITTON, HICK, MALCOLM, AND SMART.

A study of Hobbes' *De Cive*, Hume's *Dialogues concerning Natural Religion*, and Tolstoy's *What is Art?*

\*103. *ELEMENTARY LOGIC*. Either term. Credit three hours. Open to freshmen. Fall term, M W F 12 and 2; T Th S 9 and 12. Spring term, M W F 10; T Th S 10 and 12. Registration is limited to 40 students a section. Messrs. ALBRITTON, BLACK, HENSON, RAWLS, SACHS, and SINGER.

This course is intended for students who do not expect to take further work in logic or related subjects. (Majors are advised to enroll in Philosophy 323, with the instructor's consent.) The object is to provide a nontechnical introduction to the problems that arise in the attempt to reason soundly. Problems of deductive and inductive logic are discussed and special attention is given to the analysis of logical fallacies. Lectures, discussion, and exercises.

202. *ELEMENTARY SEMANTICS*. Spring term. Credit three hours. Open to sophomores and upperclassmen. M W F 2. Mr. BLACK.

A survey of the philosophy of language and symbolism, with detailed practice in interpretation. Topics include sign-using behavior, the nature of language, special types of discourse (scientific, poetic, mathematical), semantic fallacies. Lectures and discussion.

210. *PHILOSOPHICAL PROBLEMS*. Fall term. Credit three hours. Open to sophomores and juniors, others by consent of the instructor. T Th S 12. Mr. ALBRITTON.

An investigation of selected philosophical problems. One lecture and two periods of discussion weekly. Study of contemporary, as well as classical sources. Topics for 1956-1957: The Mind-Body Problem and Freedom of the Will.

221-222. *ETHICS*. Throughout the year. Credit three hours a term. First term prerequisite to the second. Open to sophomores and upperclassmen. M W F 11. Mr. BROWN.

Fall term: the basic moral ideas of Western civilization as interpreted by its major philosophers and moralists—Greek ethical theory, Old and New Testament morality, Hobbes and the British Utilitarians, Butler and Kant. Spring term: an intensive study of selected problems in ethical theory; readings in John Stuart Mill, Sidgwick, Bradley, Moore, and Prichard.

230. *AESTHETICS: PHILOSOPHY OF ART*. Fall term. Credit three hours. Open to students majoring in philosophy or in fine arts, and to others by consent of the instructor. T Th S 11. Mr. SMART.

A critical study of outstanding theories of art, ancient, modern, and contemporary.

## COURSES FOR UPPERCLASSMEN AND GRADUATES

301-302. *HISTORY OF PHILOSOPHY*. Throughout the year. Credit three hours a term. Open to juniors and seniors, and others with the consent of the instructor. T Th 9 and one hour to be arranged. Fall term, Mr. ALBRITTON. Spring term, Mr. SACHS.

Occidental philosophical thought from its Greek origins to the nineteenth century; the most important systems in their cultural context. Fall term: ancient and medieval period. Spring term: modern period.

310. *PHILOSOPHY IN LITERATURE*. Fall term. Credit three hours. For juniors and seniors. T Th S 12. Mr. SACHS.

An examination of various philosophical questions concerning the condition and conduct of human life, and of divergent answers to such questions, as they appear in a selection of literary works, from Sophocles' *Oedipus Rex* to Kafka's *Metamorphosis*.

312. *PHILOSOPHY IN CONTEMPORARY THOUGHT*. Spring term. Credit three hours. Open to juniors and seniors, and to sophomores by consent of the instructor. M W F 9. Mr. SINGER.

Modern philosophy in its relation to thinking in other fields, with particular emphasis upon questions about meaning and truth in art, religion, and metaphysics. Philosophies examined include Pragmatism, Humanism, Existentialism, and Positivism.

313. *AMERICAN PHILOSOPHY*. Fall term. Credit three hours. Open to juniors and seniors. M W F 9. Mr. BROWN.

American political philosophy: Puritanism, Inalienable Rights, the *Federalist Papers*, Calhoun.

321. *CHRISTIAN THEOLOGY*. Fall term. Credit three hours. Open to juniors and seniors, and to sophomores by consent of the instructor. M W F 12. Mr. HICK.

A historical and critical study of the basic theological concepts of Christianity.

322. *PHILOSOPHY OF RELIGION*. Spring term. Credit three hours. Open to juniors and seniors, and to sophomores by consent of the instructor. M W F 12. Mr. BURTT.

A study of the major types of religious belief in the modern Western world in relation to their philosophical background, and of the task of rethinking one's religious convictions under the challenge of contemporary problems.

323. *DEDUCTIVE LOGIC*. Fall term. Credit three hours. Prerequisite, Philosophy 103 or consent of the instructor. M W F 3:30. Mr. BLACK.

A study of current methods and problems of formal logic, with discussion of relevant philosophical issues; algebra of classes, propositional calculus, calculus of functions, the logical paradoxes, and the theory of types.

324. *INDUCTIVE LOGIC*. Spring term. Credit three hours. Prerequisite, Philosophy 323 or consent of the instructor. M W F 3:30. Mr. BLACK.

An introduction to the philosophy of induction and the foundations of probability. Topics to be discussed include the justification of induction, connections between induction and probability, the classical and frequency views of probability, the "Law of Large Numbers."

326. *POLITICAL AND SOCIAL PHILOSOPHY*. Spring term. Credit three hours. Prerequisite, Philosophy 221-222, or 301-302. M W F 12. Mr. RAWLS.

A study of the philosophical and ethical doctrines involved in such political and social conceptions as the common good, natural law and natural rights, justice and equity, tolerance and liberty. Two different traditions will be studied.

[327-328. *INTRODUCTION TO PHILOSOPHY OF SCIENCE*. Credit three hours per term. Open to juniors and seniors. First term prerequisite to the second. Mr. BLACK. Not given in 1956-1957.]

333. *PHILOSOPHY OF PSYCHOLOGY*. Spring term. Credit three hours. Open to juniors and seniors who are majoring in philosophy or psychology, to graduate students of psychology, and to others with the consent of the instructor. M W F 11. Mr. MALCOLM.

A study of the central concepts in selected theories and movements in psychology, such as Freudian psychology, Gestalt psychology, behaviorism, parapsychology, and psychical research. In any given semester, one or possibly two special topics will be chosen for systematic treatment.

423. *THEORY OF KNOWLEDGE*. Fall term. Credit three hours. Open to philosophy majors, graduate students, and others with the consent of the instructor. M W F 11. Mr. MALCOLM. Topic for 1956-1957: Spinoza.

425. *ETHICAL THEORY*. Spring term. Credit three hours. Prerequisite, Philosophy 221-222, or 301-302, or consent of the instructor. M W F 9. Mr. BROWN. Topic for 1956-1957: Utilitarianism and its critics.

481. *AESTHETICS; ADVANCED COURSE*. Spring term. Credit three hours. T Th S 9. Mr. SMART.

A study of selected classical and contemporary philosophies of art.

485. *PROBLEMS IN THE PHILOSOPHY OF RELIGION*. Spring term. Credit three hours. Prerequisite, Philosophy 322 or consent of the instructor. M W F 11. Mr. HICK.

A discussion of epistemological topics in the philosophy of religion: the religious uses of language, cognitive and non-cognitive; theism and verification; theories concerning the nature of religious faith.

## SEMINARS

575. *PLATO*. Spring term. Credit three hours. M 3-5. Mr. ALBRITTON.

Plato's metaphysics and theory of knowledge.

580. *MODERN PHILOSOPHERS*. Spring term. Credit three hours. Th 3-5. Mr. BURTT.

Topic for 1956-1957: Hegel, with an intensive study of his *Phenomenology of Mind* and his *Logic*.

585. *ETHICS AND VALUE THEORY*. Fall term. Credit three hours. Th 3-5. Mr. RAWLS.

Topic for 1956-1957: Natural law.

[588. *METAPHYSICS*. Spring term. Credit three hours. Not given in 1956-1957.]

594. *PHILOSOPHICAL ANALYSIS*. Spring term. Credit three hours. T 2:30-4:30. Mr. MALCOLM.

Topic for 1956-1957: G. E. Moore.

595. *SEMANTICS AND LOGIC*. Fall term. Credit three hours. T 2-4. Mr. BLACK.

Topic for 1956-1957: Problems in the philosophy of mathematics.

600-602. *HONORS WORK IN PHILOSOPHY*. Spring term. Credit three hours. Prerequisite, provisional acceptance as a candidate for Honors. Hours to be arranged.

For juniors and seniors. Study of selected texts and problems under the personal

supervision of members of the Staff. Required of all students expecting to graduate with Honors in Philosophy.

039. *INFORMAL STUDY*. Members of the Department.

## PHYSICS

Mr. L. P. SMITH, *Chairman*; Messrs. L. L. BARNES, H. A. BETHE, D. D. CLARK, G. COCCONI, D. R. CORSON, T. R. CUYKENDALL, J. W. DEWIRE, C. W. GARTLEIN, K. I. GREISEN, P. L. HARTMAN, D. F. HOLCOMB, B. D. McDANIEL, P. MORRISON, H. F. NEWHALL, A. W. OVERHAUSER, L. G. PARRATT, H. S. SACK, E. E. SALPETER, B. M. SIEGEL, A. SILVERMAN, R. L. SPROULL, D. H. TOMBOULIAN, R. R. WILSON, W. M. WOODWARD, and G. B. YNTEMA.

*For a major in Physics, the following courses must be completed: (1) in Physics, twenty-six hours of courses numbered above 116 (excluding courses 200 and 214), which shall include 207 and 209 or their equivalent, at least three hours of Physics 210 or its equivalent and fifteen hours selected from classroom credit in Physics 215-299; (2) in related subjects, Mathematics 201 and twelve hours in one of the following groups: (a) Chemistry, (b) Astronomy, (c) Biological Science (six hours of this must not be an introductory course), (d) Philosophy (History 165 and 166, or 911-912 may be substituted for six hours of Philosophy), (e) Geology (six hours of this must not be an introductory course).*

*Qualified students may register for informal study. Undergraduates should register for course 020; graduate students should register for course 350 or 990.*

*A student may be granted Honors in Physics if he (a) has an average grade of 85 or better in all Physics courses taken, (b) has done work of Honors caliber in course 210, (c) has taken courses 291 and 292, and (d) has, in addition to the physics major requirements, four hours (or more) credit in one of the following: (1) special project work including a satisfactory written summary and an examination, (2) graduate physics courses (courses numbered above 300), each with a grade of 80 or better, (3) interdepartmental work with the prior approval of the Physics Majors Committee and with the recommendation of the instructor(s) upon completion of the work.*

*Any student interested in the Honors program should consult with his major adviser before registering for the work of his senior year.*

**\*103-104. GENERAL PHYSICS.** Throughout the year. Credit three hours a term. Physics 103 or consent of the instructor is prerequisite to 104. Except for Physics 200, more advanced courses require Physics 107-108 or special permission for admission; hence students majoring in mathematics or a physical science should not elect Physics 103-104. Demonstration lectures, M F 9 or 11. One laboratory period and one quiz section as arranged. Mr. DEWIRE and assistants.

The development of the science and its most important principles. The interrelation of the several fields of physics as well as their relations to the other sciences and daily life.

**\*107-108. INTRODUCTORY PHYSICS.** Throughout the year. Credit four hours per term. Prerequisite, calculus or concurrent registration therein. Physics 107 or 103 and consent of the instructor is prerequisite to 108. Primarily for students majoring in mathematics or science. Demonstration lecture W 11, three recitations and one laboratory period as arranged. Mr. HOLCOMB and assistants.

Emphasis is on the development of the important facts in the several fields of physics and the analytical techniques of problem and laboratory work.

*Note:* Physics 115, 116, 117, and 118 form a sequence in a two-year continuous course in General Physics required of all students of engineering who are candidates

for the degree of B.Ch.E., B.E.E., B.Eng.Phys., and B.M.E. Physics 115, 116, 113, and 114 constitute the corresponding sequence for candidates for the degree B.C.E. Demonstrations, theory, experiments, and problem drill. One lecture, two recitations, and one laboratory period a week, as assigned. Consult instructor in charge for available recitation and laboratory periods other than the ones described below.

113. *ELECTRICITY AND MAGNETISM*. Fall term. Credit two hours. Prerequisite, Physics 115, 116, calculus or simultaneous registration in Mathematics 163. Lecture T 10, one recitation and one discussion period a week to be arranged and one laboratory period of 2½ hours on alternate weeks to be arranged. For students of Civil Engineering only. Mr. ——— and assistants.

Survey of the fundamental laws of electric and magnetic fields, electric circuits, induced emfs, inductance, and capacitance. The laboratory experiments are illustrative of the topics mentioned.

114. *PHYSICAL OPTICS AND ATOMIC PHYSICS*. Spring term. Credit two hours. Prerequisite, Physics 113. Lecture T 10, one recitation and one discussion period a week to be arranged, and one laboratory period of 2½ hours on alternate weeks to be arranged. For students of Civil Engineering only. Mr. ——— and assistants.

Survey of electromagnetic waves and their applications to optical phenomena. Survey of selected topics in atomic and nuclear physics, electron emission, and photoelectricity. The laboratory experiments are illustrative of the topics mentioned.

115. *MECHANICS*. Fall term. Credit three hours. Prerequisite, calculus or simultaneous registration in Mathematics 161 or 181. Entrance Physics is desirable but not required. Lecture T 9, 11, or 2. Recitations, M F 9. Laboratory, M 2-4:30. Mr. NEWHALL and assistants.

Statics, kinematics, dynamics, energetics, elasticity, mechanics of fluids. The laboratory work consists of measurements related to the above topics.

116. *HEAT, SOUND, AND GEOMETRICAL OPTICS*. Spring term. Credit three hours. Prerequisites, Physics 115, calculus, or simultaneous registration in Mathematics 162, 182 or 192. Lecture, T 9, 11, or 2. Recitations, M F 9. Laboratory, M 2-4:30. Mr. NEWHALL and assistants.

Temperature, calorimetry, change of state, heat transfer, thermal properties of matter, elementary thermodynamics, wave motion, vibrating bodies, acoustical phenomena, geometrical optics, reflection, refraction, mirrors and lenses. The laboratory work consists of measurements related to the above topics.

117. *ELECTRICITY AND MAGNETISM*. Fall term. Credit three hours. Prerequisites, Physics 115, 116, calculus, or simultaneous registration in Mathematics 163. Lecture, Th 8 or 11. Recitations, T Th 10. Laboratory, M 2-4:30. Mr. TOMBOULIAN and assistants.

Introductory study of the fundamental laws of electric and magnetic fields and their applications to elementary circuit problems. Electrostatic fields and potential; steady currents, induced emfs, inductance, dielectrics, capacitance, and simple transients. The laboratory work consists of basic measurements in direct current circuits.

118. *PHYSICAL OPTICS AND ATOMIC PHYSICS*. Spring term. Credit three hours. Prerequisite, Physics 117. Lecture, Th 8 or 11. Recitations, T Th 10. Laboratory, M 2-4:30. Mr. ——— and assistants.

Properties of electromagnetic waves and their application to optical phenomena; interference, diffraction, and polarization. Selected topics in atomic and nuclear physics: spectra, electron emission, processes, radioactivity, and nuclear reactions. The laboratory work consists of basic experiments in physical electronics and physical optics.



200. *PHYSICS FOR STUDENTS OF BIOLOGY*. Either term. Credit three hours. Prerequisites, six semester hours of college work in each of the following: physics, chemistry, and biological science. Students having grades below 70 in Physics 103 and 104 are not encouraged to elect this course. Lectures, T Th 12. Laboratory, T or F 2-4. Mr. BARNES.

Lectures, and laboratory experiments dealing with such topics in molecular physics, electricity and magnetism, electromagnetic radiation, and nuclear physics as are related to the study of biology.

207. *ADVANCED GENERAL PHYSICS*. Fall term. Credit three hours. Prerequisites, Physics 107 and 108, and Mathematics 162 or 182 (or consent of instructor). M W F 9. Mr. PARRATT.

This course, primarily for students intending to major in mathematics or in a physical science, completes the general introduction to Physics begun in courses 107-108.

Probability, statistics, and error theory; oscillation systems (mechanical, electrical, etc.); and thermodynamics.

208. *PHYSICAL MECHANICS AND PROPERTIES OF MATTER*. Spring term. Credit three hours. Prerequisites, Physics 115 and Mathematics 161 and 162. Primarily for candidates for the degree of Bachelor of Engineering Physics. M W F 10. Mr. HARTMAN.

Elements of kinematics; Newton's law; conservation laws; application to selected problems; hydrostatics; elementary fluid dynamics.

209. *ADVANCED GENERAL LABORATORY*. Either term. Credit three hours. Prerequisites are the same as for course 207. M W 1:40-4:30. Fall term, Mr. PARRATT. Spring term, Mr. GREISEN.

Selected experiments from several subjects to suit the student's need, e.g., mechanics, probability, electricity, magnetism, optics, spectroscopy, and modern physics.

210. *ADVANCED LABORATORY*. Either term. Credit three hours a term. Prerequisites, Physics 207 and 209 or the equivalent. Laboratory T W or Th F 1:40-4:30. Messrs. HARTMAN, CLARK, COCCONI, CORSON, CUYKENDALL, GREISEN, McDANIEL, PARRATT, SILVERMAN, SPROULL, and WOODWARD.

About sixty different experiments are available among the subjects of mechanics, acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, heat, X-rays, crystal structure, solid state, cosmic rays and nuclear physics. During the term the student is expected to perform five to ten experiments, selected to meet his individual needs. Stress is laid on independent work on the part of the student. Required for Physics majors.

214. *ATOM, NUCLEAR, AND ELECTRON PHYSICS*. Spring term. Credit three hours. Two lectures and one recitation. Prerequisites, Physics 118 and Mathematics 607 (E. E. curriculum) or the equivalents. Primarily for students in electrical engineering. Two lectures and one recitation hour to be arranged. Mr. SPROULL.

Elements of nuclear and atomic structure, fundamentals of quantum theory, basic kinetic theory of atoms and electrons; electronic processes with special reference to the electrical properties of metals, semiconductors, and insulators and to general electron emission processes; elements of nuclear processes.

[215. *PHYSICAL OPTICS*. Fall term. Credit three or five hours. Prerequisites, Physics 118, or 207 and 209 or their equivalent (209 may be taken concurrently). Lectures, M W F 9. Laboratory, Th F 1:40-4:30. Mr. HARTMAN.

Huygens' and Fermat's principles with applications to geometrical optics, the thick-lens, velocity of light, interference phenomena. Fraunhofer and Fresnel diffraction with applications to image formation, polarization of light, double refraction, optical

activity, electromagnetic characteristics, dispersion and absorption, and reflection. Not given in 1956-1957.]

225. *ELECTRICITY AND MAGNETISM*. Either term. Credit three hours. Prerequisite, Physics 117 or 207 and 209 or their equivalent (209 may be taken concurrently). Lectures, T Th S 9, and an optional problem period to be arranged. Fall term, Mr. CORSON. Spring term, Mr. ———.

Electrostatic and electromagnetic fields, polarization of dielectrics and magnetic media, displacement current, plane electromagnetic waves, the Poynting vector.

235. *ELECTRICITY AND MAGNETISM*. Fall term. Credit three hours. Prerequisites, Physics 225 and differential equations. Lectures, M W F 11. Mr. WOODWARD.

Circuit theory from the standpoint of electromagnetic fields. Validity and limitation of circuit concepts. Steady and alternating currents in circuits and networks, distributed parameters, introductory high-frequency topics, high-energy machines.

242. *ANALYTICAL MECHANICS*. Spring term. Credit three hours. Prerequisites, Physics 207 and Mathematics 201, or their equivalents. M W F 11 and an optional period to be arranged. Mr. SILVERMAN.

Analytical mechanics of material particles, systems of particles and rigid bodies; planetary motion, stability of orbits; collisions; Euler's equations, gyroscopic motion; Lagrange's equations; relativistic mechanics.

243-244. *ATOMIC, MOLECULAR, AND NUCLEAR PHYSICS*. Throughout the year. Credit three hours a term. Prerequisite, Physics 225 or consent of instructor. M W F 10. Fall term, Mr. McDANIEL. Spring term, Mr. GREISEN.

The fundamental particles of physics, statistical physics, the concepts of quantum mechanics, atomic structure and spectra, the periodic table, molecular structure and the chemical bond, properties of nuclei, nuclear reactions, interaction of radiation with nuclei, behavior of high-energy particles, and cosmic rays.

254. *ELECTRONIC PROPERTIES OF SOLIDS AND LIQUIDS*. Spring term. Credit three hours. Prerequisite, Physics 243. M W F 9. Mr. SACK.

A semiquantitative introduction to the concepts of modern solid state physics, covering lattice structure, lattice defects, lattice vibrations, cohesive energy, elastic and anelastic properties, electron theory of metals and semiconductors, dielectric and magnetic properties.

258. *MECHANICS OF CONTINUA*. Spring term. Credit three hours. Prerequisite, partial differential equations or consent of the instructor. Hours to be arranged. Mr. SACK.

Stress and strain tensors; fundamental equations of motion in continuous media; generalized equations of state; applications to special topics in elasticity, wave propagation, vibration, flow of ideal and viscous fluids, etc.

291-292. *HONORS SEMINAR*. Credit one hour a term. Prerequisite, consent of the student's major adviser (or of the instructor, if the student is not majoring in physics). For undergraduates, ordinarily seniors, who qualify for advanced study and research in physics. M 2. Messrs. SPOULL, SALPETER, and others.

Practice in organization, oral presentation, and discussion of selected topics in physics.

020. *INFORMAL STUDY IN PHYSICS*. Either term. Credit one to three hours a term. Hours to be arranged. Reading or laboratory work in any branch of physics under the direction of a member of the staff. Permission of the staff member under whose direction the work is to be done must be obtained before registration.

350. *INFORMAL GRADUATE LABORATORY*. Either term. Credit one to three hours a term. T W or Th F 1:40-4:30. Associated with the Physics 380 Laboratory.

Primarily for graduate students who do not have the prerequisites for Physics 380. Mr. HARTMAN and STAFF.

380. *ADVANCED LABORATORY*. Either term. Credit three hours a term. Prerequisite, Physics 210 or the equivalent. Laboratory, T W or Th F 1:40-4:30. Messrs. HARTMAN, CLARK, COCCONI, CORSON, CUYKENDALL, GREISEN, McDANIEL, PARRATT, SILVERMAN, SPROULL, and WOODWARD.

About seventy different experiments are available among the subjects of mechanics, acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, heat, X-rays, crystal structure, solid state, cosmic rays, and nuclear physics. During the term the student is expected to perform five to ten experiments, selected to meet his individual needs. Stress is laid on independent work on the part of the student. Two terms are ordinarily required for first-year graduate physics students.

390. *RESEARCH*. Either term. Credit three hours a term. Prerequisite, two terms of Physics 380 or the equivalent. Hours to be arranged. Practice in the techniques, methods, and interpretation of research. May be taken under the direction of any member of the staff or in association with the Physics 380 laboratory. Permission of the staff member under whose direction the work is to be done must be obtained before registration.

475. *THEORETICAL MECHANICS*. Fall term. Credit four hours. Prerequisite, Physics 242 or its equivalent. T Th S 11 and S 12. Mr. ———.

476. *ELECTRODYNAMICS*. Spring term. Credit four hours. Prerequisite, Physics 225 or its equivalent. T Th S 11 and S 12. Mr. ———.

477. *STATISTICAL MECHANICS AND KINETIC THEORY*. Fall term. Credit three hours. Prerequisites, Physics 475 and (or in parallel) Physics 485. T Th S 9. Mr. ———.

485. *INTRODUCTORY QUANTUM MECHANICS*. Fall term. Credit three hours. Prerequisites, Physics 475 and 476. T Th S 12. Mr. ———.

486. *APPLICATIONS OF QUANTUM MECHANICS*. Spring term. Credit three hours. Prerequisite, Physics 485. T Th S 12. Mr. ———.

[491. *ADVANCED QUANTUM MECHANICS*. Fall term. Credit three hours. Prerequisite, Physics 486. Mr. ———. Not offered in 1956-1957.]

[588. *X-RAYS*. Spring term. Credit three hours. Prerequisite, Physics 243 and 244 or the equivalent. M W F 11. Mr. PARRATT. Not offered in 1956-1957.]

675. *SOLID STATE PHYSICS*. Fall term. Credit three hours. Prerequisites, intermediate atomic physics, electricity and mechanics, or consent of instructor. M W F 11. Mr. OVERHAUSER.

676. *ADVANCED SOLID STATE PHYSICS*. Spring term. Credit three hours. Prerequisites, Physics 475, 476, 485, 675 or consent of instructor. T Th S 9. Mr. OVERHAUSER.

[775. *INTRODUCTORY NUCLEAR PHYSICS*. Fall term. Credit three hours. Prerequisites, Physics 243 and 244 or their equivalent. M W F 9. Mr. CORSON. Not offered in 1956-1957.]

[776. *NUCLEAR AND PARTICLE PHYSICS*. Spring term. Credit two hours. Prerequisites, Physics 485 and 775, or consent of the instructor. W F 11. Mr. WILSON. Not offered in 1956-1957.]

[782. *THEORY OF NUCLEI*. Spring term. Credit two hours. Prerequisites, Physics 485 and 775 or their equivalents. M F 9. Not offered in 1956-1957.]

784. *COSMIC RAYS*. Spring term. Credit three hours. T Th S 9. Mr. COCCONI.

786. *THEORY OF HIGH-ENERGY PHENOMENA*. Spring term. Credit two hours. Prerequisite, Physics 486 or the equivalent. M F 9. Mr. ———.

900. *SEMINAR IN ADVANCED PHYSICS*. Upon sufficient demand and student interest, seminars will be arranged from time to time in topics not currently covered in regular courses, such as advanced solid-state theory, applied group theory, general relativity theory, electronics, low-temperature physics, X-rays, etc.

990. *INFORMAL STUDY IN PHYSICS*. Either term. Credit one to three hours a term. Hours to be arranged. Special study in some branch of physics, either theoretical or experimental, under the direction of a member of the staff. Permission of the staff member under whose direction the work is to be done must be obtained before registration.

## PSYCHOLOGY

Mr. T. A. RYAN, *Chairman*; Messrs. G. W. BOGUSLAVSKY, U. BRONFENBRENNER, R. DALTON, F. S. FREEMAN, J. J. GIBSON, J. E. HOCHBERG, W. W. LAMBERT, H. S. LIDDELL, R. B. MACLEOD, Mrs. P. C. SMITH, Messrs. R. A. WALK, A. L. WINSOR.

*For a major in Psychology, the following courses must be satisfactorily completed: (1) in Psychology, twenty-four hours in courses numbered above 200, at least three of the twenty-four hours to be in a basic laboratory course (207, 216, 221) and at least three further hours to be in the general experimental field (207, 216, 221, 223, 224); 101 and 112 are the recommended elementary courses for majors; (2) Statistics, ILR 210, or equivalent, and Physiology 303 or Zoology 201, or equivalent; (3) nine hours in a single related field approved by the major adviser. The following fields are recommended: Education, Mathematics, Physics, Philosophy, Sociology and Anthropology, Statistics, and Zoology.*

*Major students are advised to secure a broad background in the physical, the biological, and the social sciences and in philosophy.*

*Candidates for the degree of Bachelor of Arts with Honors in Psychology are required to take a series of two Honors seminars (Psychology 491 and 492) and a six-hour thesis course (Psychology 499) as part of their departmental requirements.*

*Honors candidates must have a general grade average of 80 and a departmental average of 85 for entrance into the program, except under special conditions. These averages will be based on the candidate's work for the first two years.*

*Honors candidates will prepare and defend a thesis and will take a general comprehensive examination at the end of the senior year. A list of other required courses for Honors candidates can be obtained in the Department office.*

*In cooperation with the Department of Sociology and Anthropology, a concentration in Social Psychology is available for adequately prepared students. Under this program a student may obtain a major in either department. Prerequisites for the concentration include two beginning courses in Sociology and Anthropology, Psychology 101 plus three further hours of Psychology. Any student interested in the concentration should consult his major adviser as early as possible in his college career.*

*Informal study is offered to a limited number of upperclass majors only. Consent of the instructor is required. The purpose of such study is to permit a student to carry out specialized research or study projects not covered by existing courses.*

## ELEMENTARY COURSES

\*101. *INTRODUCTION TO PSYCHOLOGY*. Either term. Credit three hours. Open to freshmen. Two lectures plus either a third lecture or a recitation section each week, as announced. Fall term: lectures M W (F) 10, recitation Th 9, 11, 12, F 8 or

10; lectures (M) W F 11; recitation M 12, 3, T 9, 10, or 12; lectures T Th (S) 9; recitation F 12, 3, M 9, 10, or 3; lectures T Th (S) 11; recitation F 10, 12, 3, S 10 or 12. Spring term: lectures (M) W F 10; recitation M 11, 12, 2, T 9 or 11; lectures (M) W F 12; recitation M 9, 11, 2, T 10 or 12; lectures M W (F) 2; recitation F 9, 12, 2, S 9 or 11.

An introduction to the scientific study of behavior and experience, covering such topics as perception, motivation, emotion, learning, thinking, personality, and individual differences. This course is prerequisite to further work in the Department.

**\*102. CONTEMPORARY PROBLEMS OF PSYCHOLOGY.** Spring term. Credit three hours. Prerequisite, Psychology 101. M W 11, recitation Th 9, 11, F 11 or 12. Mr. MacLEOD.

An analysis of current research problems selected for their relevance to general theoretical issues and as illustrative of modern research methods in psychology. Specific topics will be chosen from the fields of perception, learning, motivation, personality theory, and the like.

**103. EDUCATIONAL PSYCHOLOGY.** Fall term. Credit three hours. Prerequisite, an introductory course in psychology. M W 11, recitation Th 8, 10, 3, or F 11. Mr. FREEMAN.

The major facts and principles of psychology bearing on educational practice and theory.

**\*106. PSYCHOLOGY IN BUSINESS AND INDUSTRY.** Spring term. Credit three hours. Prerequisite, Psychology 101. M W F 11. Mrs. SMITH.

Applications of psychological methods in worker selection and training, conditions of efficient production, motivation in industrial performance, accident control, psychological aspects of marketing.

**107. PSYCHOLOGICAL BASIS OF SOCIAL BEHAVIOR.** Either term. Credit three hours. Prerequisite, Psychology 101. Fall term: M W 12, recitation S 9, 11, or 12, Mr. WALK. Spring term: M W 12, recitation Th 8, 10, or 12. Mr. GIBSON.

An introduction to the psychological study of social behavior, with emphasis on the ways in which it is learned, designed primarily for students who do not plan to do further work in social psychology.

**\*112. MODERN PSYCHOLOGY IN HISTORICAL PERSPECTIVE.** Either term. Credit three hours. Prerequisite, Psychology 101. Fall term: M W 12, recitation Th 8, 12, 3 or F 8. Mr. HOCHBERG. Spring term: M W F 9, Mr. MacLEOD.

A systematic survey of present-day problems, methods, and points of view, considered in the perspective of their historical development. Recommended for students who propose to do advanced work in psychology.

## INTERMEDIATE COURSES

**203. THE NATURE OF MAN: DEVELOPMENT AND PERSONALITY.** Fall term. Credit three hours. Prerequisite, one of the following: a course in Psychology, Sociology-Anthropology, Child Development and Family Relationships, or Zoology 201 (or equivalent), or consent of instructor. M W F 10. Messrs. BRONFENBRENNER and LAMBERT.

A study of the development of personality from infancy to adulthood viewed from a biological, psychological, and cross-cultural perspective. Special emphasis is given to the role of social interaction, beliefs, and values both as determinants and products of personality.

*Psychology 203 is one of three interdepartmental courses dealing with the general topic of the nature of man from the perspectives of the behavioral and biological*



*sciences. The other courses in the group are Zoology 201 and Sociology-Anthropology 204. The courses may be taken singly or in any order.*

**207. EXPERIMENTAL PSYCHOLOGY: PERCEPTION.** Fall term. Credit three hours. Prerequisites, Psychology 101, elementary statistics, and three further hours of psychology, preferably Psychology 112. Lectures, M W 10. Laboratory, Th 2-4. Mr. GIBSON.

An account of the ways in which the normal human adult registers and apprehends his environment. The experimental study of psychophysical correlation, of space, motion, objects, and events, and the relations of perceiving to everyday behaving and thinking.

**216. EXPERIMENTAL PSYCHOLOGY: LEARNING.** Fall term. Credit three hours. Prerequisites, Psychology 101, elementary statistics, and three further hours of psychology, preferably Psychology 112. Lectures, W F 9. Laboratory, T 2-4. Mr. WALK.

The fundamental conditions and principles of learning, both animal and human. A review of selected experimental literature, with special emphasis upon recent developments in the field.

**221. EXPERIMENTAL PSYCHOLOGY: MOTIVATION.** Spring term. Credit three hours. Prerequisites, Psychology 101, elementary statistics, and three further hours of psychology, preferably Psychology 112. Lectures, T Th 11. Laboratory W 2-4 or Th 2-4. Mr. RYAN.

A study of the initiation, direction, and regulation of behavior. The classic problems of instinct, emotion, conflict, and will are examined in the light of evidence from current experimental, clinical, and social research.

**223. PHYSIOLOGICAL PSYCHOLOGY.** Fall term. Credit three hours. Prerequisites, Psychology 101 and three further hours of psychology, preferably Psychology 112, or consent of instructor. T Th S 10. Mr. BOGUSLAVSKY.

Lectures and discussions on the physiological mechanisms of behavior with emphasis on sensory processes, innate activity, learning, and emotion.

**224. PSYCHOBIOLOGY.** Spring term. Credit three hours. Prerequisites, Psychology 101, Physiology 303 or equivalent, and three further hours of psychology, preferably Psychology 112. T Th S 10. Mr. LIDDELL.

The principal biological mechanisms of behavior with special reference to man. Neurophysiology, endocrinology, and conditioning in relation to the problems of human behavior.

**301. SOCIAL PSYCHOLOGY.** Fall term. Credit three hours. Prerequisites, 3 hours of psychology and 3 hours of sociology and anthropology, or consent of instructor. M W F 12. Mr. ———.

A comprehensive analysis of the history, concepts, methods, and theories of social psychology, including such topics as the socialization of motives and values, alteration of opinion and attitude, psychological bases of prejudice, language, communication, propaganda, psychological warfare, competition, and the psychology of groups. This course constitutes the first half of a full-year sequence in social psychology. The second half is listed as Sociology and Anthropology 302. These courses may be taken separately.

**331. METHODS OF INDUSTRIAL SELECTION AND PLACEMENT.** Fall term. Credit three hours. Prerequisites, Psychology 101 and elementary statistics. M W F 9. Mrs. SMITH.

Techniques of developing and evaluating selection and placement procedures, including such topics as development of criteria of industrial performance, analysis of reliability, methods of item analysis, validation of interviews, tests, and personal

history data. It is desirable, but not required, that Psychology 351 or Rural Education 255 be taken before this course.

332. *WORK, FATIGUE, AND EFFICIENCY*. Spring term. Credit three hours. Prerequisite, Psychology 101. M W F 9. Mrs. SMITH.

A survey of the external and internal factors which affect the efficiency, speed, and accuracy of human work. Consideration will be given to sedentary or "mental" work as well as to physical work, in relation to fatigue, monotony, rest, sleep, and the effects of noise, light, temperature, incentives, and social factors.

336. *PSYCHOLOGICAL PROBLEMS OF ADVERTISING AND MARKET RESEARCH*. Spring term. Credit three hours. Prerequisites, Psychology 101 and elementary statistics. M W F 10. Mr. HOCHBERG.

Methods of measuring the effects of advertising on consumer opinion and behavior. Psychological marketing survey methods and typical results. General problems of consumer motivation. Offered in alternate years.

351. *PSYCHOLOGICAL TESTS: I*. Fall term. Credit three hours. Prerequisites, 6 hours in psychology and a course in elementary statistics, or consent of instructor. Not open to sophomores. T Th S 9. Mr. FREEMAN.

Basic psychological principles in the construction and use of individual and group tests of intelligence and of specific aptitudes; theories of the nature of mental abilities; fields of application; intensive study of selected scales.

352. *PSYCHOLOGICAL TESTS: II*. Spring term. Credit three hours. Prerequisite, Psychology 351 and consent of instructor. T Th S 9. Mrs. MEYER.

Basic psychological principles in the construction and use of personality rating scales, personality inventories, projective techniques, and situational tests. Demonstrations.

375. *STATISTICAL METHODS IN PSYCHOLOGY*. Fall term. Credit three hours. Prerequisites, Psychology 101 and elementary statistics. M W F 2. Mr. RYAN.

An analysis of the methods for treating various kinds of psychological data. Tests of significance, correlational analysis and analysis of variance, in their application to psychological research.

### ADVANCED COURSES

401. *EMOTION*. Spring term. Credit three hours. Prerequisite, 9 hours in psychology or consent of instructor. M W F 10. Mr. WALK.

An analysis of the contemporary theories of emotion in light of current psychological and physiological research.

405. *MAIN CONCEPTS OF ABNORMAL PSYCHOLOGY*. Fall term. Credit three hours. Prerequisite, nine hours of psychology or consent of the instructor. T Th S 11. Mr. LIDDELL.

Examination of basic concepts from biology, psychology, and sociology currently employed in the analysis and interpretation of abnormal behavior.

[410. *INDIVIDUAL DIFFERENCES*. Spring term. Credit three hours. Prerequisite, Psychology 351. T Th 2-3:15. Mr. FREEMAN.

The nature and causes of variations in human abilities. Their educational and social implications. Not offered in 1956-1957.]

[411. *PROCEDURES IN CLINICAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, Psychology 351 and consent of instructor. Primarily for seniors and graduate students. M 4-6, and conferences to be arranged. Mr. FREEMAN.

Procedures and instruments used with clinical cases involving problems of learning and of behavioral adjustment. Not offered in 1956-1957.]

422. *COMPARATIVE PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, six hours of psychology or consent of instructor. Lectures, W F 11. Laboratory, F 2-4. Mr. BOGUSLAVSKY.

Study of psychological and structural similarities and differences among representative phyla and species.

426. *EXPERIMENTAL PSYCHOPATHOLOGY*. Either term. Credit three hours. Prerequisites, Psychology 101, and consent of instructor. Laboratory hours to be arranged. W 2-5. Mr. LIDDELL.

The application of experimental methods to the behavior disorders; analysis of contemporary theories of behavior pathology; laboratory work in experimental neuroses.

432. *PSYCHOLOGY OF LANGUAGE AND THINKING*. Fall term. Credit three hours. Prerequisites, Psychology 101 and three additional hours in psychology, preferably 112. M W F 11. Mr. MacLEOD.

An approach to the psychological study of thinking through the analysis of the processes of communication. Material will be drawn from studies of linguistic development, from the pathology of language, from comparative linguistics, and from experimental studies of language and thinking. The course is designed for students of philosophy, language, and literature as well as for students of psychology.

456. *RESEARCH METHODS IN INDUSTRIAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, consent of instructor. M 2, and laboratory hours to be arranged. Mrs. SMITH.

An introduction to research techniques in industrial psychology. Projects in local factories and business institutions and in the laboratory are conducted as exercises in such areas as test construction, analyses of reliability and validity of test and interview methods, studies of morale, learning, methods, fatigue, and job analysis programs.

476. *TECHNIQUES OF EXPERIMENTATION*. Spring term. Credit three hours. Prerequisite, consent of instructor. T 2-4. Laboratory hours to be arranged. Mr. HOCHBERG.

An advanced course in experimental psychology, stressing the methods of planning and executing experiments. The group will plan and conduct experiments on selected problems. Recommended for students who plan to do graduate work in psychology and for major students in related sciences.

485. *CONTEMPORARY PSYCHOLOGICAL THEORY*. Fall term. Credit three hours. Prerequisite, consent of instructor. M W F 3. Mr. GIBSON.

A survey of the main theoretical trends—behavioristic, Gestaltist, Freudian, etc.—in contemporary psychology, with a detailed examination of representative problems as they are approached from these different points of view. Together with Psychology 112 this course provides an orientation in systematic psychology.

050. *INFORMAL STUDY*. Either term. Credit one, two, or three hours. The STAFF.

### SEMINARS FOR HONORS CANDIDATES

491. *CLASSIC PROBLEMS IN PSYCHOLOGICAL THEORY*. Spring term. junior year. Credit three hours. Time to be arranged. Mr. ———.

The seminar will read and discuss representative works of men who have been most influential in setting the directions of modern psychology. While no fixed list of books will be required, the attempt will be made to sample all the major types of psychological theory.

492. *CURRENT ISSUES IN PSYCHOLOGICAL RESEARCH*. Fall term, senior year. Credit three hours. Time to be arranged. Mr. ———.

The seminar will select for close study a few research problems of current interest. These problems will be drawn from widely different fields, such as experimental, social, developmental, industrial, comparative, differential, etc., the selection being made in the light of the special interests of the seminar members. Students will be encouraged during the course of this seminar to formulate a number of problems that might become topics for their honors theses.

499. *HONORS THESIS*. Spring term, senior year. Credit six hours. Time to be arranged.

This will represent an investigation, under the supervision of a member of the staff, of a problem in any of the major fields of psychological research. Candidates will for the most part work independently but may, from time to time, be called together for progress reports.

### GRADUATE SEMINARS

Primarily for graduate students, but with the consent of the instructor may be taken by qualified undergraduates. Approximately five seminars will be offered each term, the selection to be determined by the needs of the students. During the preregistration period, the list of seminars for the following term will be posted, specifying instructors, topics to be covered, and hours of meeting.

501. *GENERAL SEMINAR FOR BEGINNING GRADUATE STUDENTS*. Either term. Credit three hours.

511. *PERCEPTION*. Either term. Credit three hours.

513. *LEARNING*. Either term. Credit three hours.

515. *MOTIVATION*. Either term. Credit three hours.

517. *THINKING*. Either term. Credit three hours.

521. *PSYCHOBIOLOGY*. Either term. Credit three hours.

523. *PSYCHOPHYSIOLOGY*. Either term. Credit three hours.

531. *HISTORY OF PSYCHOLOGY*. Either term. Credit three hours.

541. *STATISTICAL METHODS*. Either term. Credit three hours.

543. *CLINICAL METHODS; PRACTICE IN PSYCHOLOGICAL TESTING*. Either term. Credit three hours. All students must have consent of the instructor.

545. *METHODS OF SOCIAL ANALYSIS*. Either term. Credit three hours.

547. *METHODS OF CHILD STUDY*. Either term. Credit three hours.

562. *HUMAN DEVELOPMENT AND BEHAVIOR*. Fall term. Credit three hours.

571. *SOCIAL PSYCHOLOGY*. Either term. Credit three hours.

573. *PERSONALITY, NORMAL AND ABNORMAL*. Either term. Credit three hours.

581. *INDUSTRIAL PSYCHOLOGY*. Either term. Credit three hours.

591. *EDUCATIONAL PSYCHOLOGY*. Either term. Credit three hours.

600. *THE TEACHING OF PSYCHOLOGY*. Either term. Credit three hours.

## SOCIOLOGY AND ANTHROPOLOGY

Mr. LAURISTON SHARP, *Chairman*; Messrs. J. P. DEAN, A. R. HOLMBERG, N. KAPLAN, W. W. LAMBERT, A. H. LEIGHTON, M. E. OPLER, M. ROSENBERG, R. J. SMITH, G. F. STREIB, E. A. SUCHMAN, W. E. THOMPSON, R. M. WILLIAMS, JR.

*For a major in Sociology and Anthropology the following courses must be completed: (1) Sociology and Anthropology 101-102, or 103-104, or 101-103; (2) Sociology and Anthropology 221; (3) twenty-one additional hours in the Department; and (4) eighteen hours in related subjects to be chosen with the approval of the adviser. Statistics (Industrial and Labor Relations 210) may be counted as a departmental course for a major.*

*Students interested in training for careers in the field of social work should consult Mr. Taietz, Rural Sociology.*

*Students seeking admission to the Department's Honors program should file application, on a form obtainable in the departmental office, not later than November 1 of their junior year. Honors candidates must have a general average of at least 80 and an average in departmental courses of at least 85.*

*In cooperation with the Department of Psychology, a concentration in Social Psychology is available for adequately prepared students. Under this program a student may obtain a major in either department. Prerequisites for the concentration include two beginning courses in Sociology and Anthropology, Psychology 101, and three additional hours in Psychology. Students interested in the concentration should consult their major adviser as early as possible in their college career.*

*Informal study is offered to a limited number of upperclass majors only. Consent of the instructor is required. The purpose of such study is to permit a student to secure specialized instruction not covered by existing courses.*

## SOCIOLOGY

\*101. *AMERICAN SOCIETY—I.* Either term. Credit three hours. Open to all students. Lectures for freshmen: fall term, T Th 10, or M W 11, with discussion sections to be arranged; spring term, lectures T Th 10, with discussion sections to be arranged. Mr. STREIB, Mr. KAPLAN and STAFF. Lectures for others: fall term, T Th S 9. Mr. WILLIAMS.

An analysis of social organization in the contemporary United States. Emphasis is placed on major American institutions—the family and kinship, social classes, ethnic groups, associations, social aspects of economic and political organization, education, and religion.

\*102. *AMERICAN SOCIETY—II.* Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101. Lectures for freshmen: T Th 10 with discussion sections to be arranged. Mr. KAPLAN and STAFF. Lectures for others: T Th S 9. Mr. WILLIAMS.

A study of the functional interrelations of groups and institutions in modern American society and the degree to which these relations are characterized by harmony or conflict. Attention is given to the themes of diversity, uniformity, and change in American life and their effects on the structure of American society.

304. *BUREAUCRATIC ORGANIZATIONS.* Spring term. Credit three hours. T Th S 11. Mr. J. THOMPSON.

The twofold objective is to familiarize the student with administrative behavior and with sociological methods of analyzing administrative organizations. Bureaucratic development in different types of organizations, such as corporations, factories, and unions as well as government agencies. Implications of bureaucratic structure for the



members of an organization, for the public it deals with, and for the democratic society in which it prevails.

310. *THE FAMILY*. Fall term. Credit three hours. M W F 9. Mr. STREIB.

A study of the family in various cultures, but particularly in American society, from the standpoint of its organization and relation to other social institutions. Emphasis is placed upon the family's major social functions—reproduction, maintenance, socialization, and the conferring of status—and upon the cyclical features of the family—courtship, marriage, parenthood, and dissolution.

320. *POLITICAL SOCIOLOGY*. Spring term. Credit three hours. Prerequisite, consent of instructor. T 2-4. Mr. W. THOMPSON.

An examination of political institutions as sociological phenomena, with emphasis on the empirical study of political behavior; politics as a functional social activity; the nature of power and its exercise in the political process; the group basis of political behavior; methodological problems in the study of political attitudes.

334. *SMALL GROUPS*. Spring term. Credit three hours. T Th 9 and one laboratory discussion hour to be arranged. Mr. KAPLAN.

Analysis of interpersonal relationships which develop in small groups, such as committees, clubs, work teams, friendship groups, and cliques. The importance of these relationships for individual behavior and for the larger social organizations of which small groups are a part is stressed. This course covers recent research in group dynamics and reference group theory as well as the relevant writings of earlier theorists. Research techniques for the study of small groups will be reviewed and applied by the students in a variety of projects.

[431-432. Now given as 101-102, Mr. WILLIAMS' section.]

433. *SOCIAL STRATIFICATION*. Fall term. Credit three hours. T Th S 11. Mr. W. THOMPSON.

Critical appraisal of theory and research in social stratification; examination of systems of hierarchical ranking, particularly in American society, based upon differential prestige and economic position; comparison of classes in terms of characteristic styles of life, attitudes, and values; patterns of vertical social mobility.

[435. *AMERICAN COMMUNITIES*. Fall term. Credit three hours. Mr. KAPLAN. Not offered in 1956-1957.]

010. *INFORMAL STUDY*. Mr. WILLIAMS.

020. *INFORMAL STUDY*. Mr. STREIB.

030. *INFORMAL STUDY*. Mr. KAPLAN, Mr. W. THOMPSON.

## ANTHROPOLOGY

\*103. *MAN AND CULTURE—I*. Fall term. Credit three hours. Open to all students. Lecture T Th 11 with discussion sections to be arranged. Mr. SHARP and STAFF.

An introduction to cultural anthropology. Similarities and differences in the organization of human behavior in a variety of cultures, including social, economic, and political relations, and perception, thought, feeling, and expression in language, the arts, and religion; cultural systems and group personality types; processes involved in changing cultures; applications of anthropology in the world today. Materials from non-Western cultures and civilizations give the student working in the social sciences or humanities some cultural perspective on the problems of his own or other complex civilizations.

\*104. *MAN AND CULTURE—II*. Spring term. Credit three hours. Open to all

students without prerequisite. T Th 11 with discussion sections to be arranged. Mr. SMITH and STAFF.

An introduction to physical anthropology, prehistoric archaeology, ethnography. Topics include human origins, evolution, early types and modern races of man; the prehistoric development of culture and the distribution of cultures in the Old and New Worlds.

204. *THE NATURE OF MAN: CULTURE AND PERSONALITY*. Spring term. Credit three hours. Prerequisites, one of the following: Zoology 201 (or equivalent), a course in Psychology (preferably Psychology 203), Sociology and Anthropology, Child Development and Family Relationships, or consent of instructors. M W F 10. Messrs. HOLMBERG and LEIGHTON.

A study of the individual in his society, emphasizing the relationship between social structure, cultural context, and human behavior. Attention is given largely to the study of personality, "normal" and "abnormal," in non-Western societies.

*This is one of three interdepartmental courses dealing with the nature of man from the perspectives of the biological and behavioral sciences. The other courses in the series are Zoology 201 and Psychology 203. These courses may be taken singly or in any order.*

411. *CULTURAL ANTHROPOLOGY*. Fall term. Credit three hours. Open to upper-classmen and graduate students. M W F 12. Mr. ———.

A study and comparison of the types of learned, shared, and transmitted behavior patterns and ideas by means of which men of various periods and places have dealt with their environment, worked out their social relations with their fellowmen, and defined their place in the cosmos. An inquiry into human nature and its expression in man's institutional and intellectual creations.

412. *CULTURE CHANGE*. Spring term. Credit three hours. M W F 9. Mr. HOLMBERG.

A study of various theories of cultural change and their relevance to the planning and execution of programs of technical and economic aid; and analysis of factors involved in maintaining stability or stimulating change in nonindustrialized cultures.

420. *CASE STUDIES IN APPLIED ANTHROPOLOGY*. Fall term. Credit three hours. Prerequisite, consent of instructor. M 7:30-9:30 p.m. Mr. SMITH and STAFF.

Designed for advanced undergraduate or graduate students in engineering, agriculture, nutrition, or the social sciences who are concerned with the modernization of economically underdeveloped regions of the world. Analysis of selected cases involving technological or other cultural change, of the reactions of participants, and of the validity of general principles of human behavior applied to these situations.

603. *NATIVE CULTURES OF THE NEW WORLD: NORTH AMERICA*. Fall term. Credit three hours. M W F 11. Mr. SMITH.

A survey of representative Indian cultures from the Eskimo of the Arctic to the Aztec of Mexico, dealing with the economic, political, and social organization, the religion, and the arts of the more important groups; American Indian origins, prehistoric movements into the New World, subsequent cultural developments, and current problems of Indian administration in the United States.

604. *NATIVE CULTURES OF THE NEW WORLD: MIDDLE AND SOUTH AMERICA*. Spring term. Credit three hours. M W F 11. Mr. HOLMBERG.

A survey of the high civilizations and other representative aboriginal cultures from the Maya to Tierra del Fuego, and of their history before the European conquest and in more recent times.

605. *NATIVE CULTURES OF ASIA AND THE PACIFIC: SOUTH ASIA AND OCEANIA*. Fall term. Credit three hours. M W F 2. Mr. SHARP.

The development and distribution of major culture types in Asia south of the mountain barrier and their extension into Australia, Melanesia, Micronesia, and Polynesia. Selected groups in the Indian subcontinent, Southeast Asia, Australia, and the Pacific islands will be discussed with emphasis on the fate of traditional cultural characteristics following the expansion of Moslem, Indic, Chinese, and Western civilizations in the area.

606. *NATIVE CULTURES OF ASIA AND THE PACIFIC: EAST ASIA*. Spring term. Credit three hours. M W F 2. Mr. SMITH.

A survey of the traditional cultures or civilizations of Japan, China, Korea, and the Soviet Far East. A discussion of Japanese national culture including the arts, religion, economy, social organization, and rural-urban contrasts; analysis of Chinese and Korean peasant communities; discussion of representative tribal peoples of Inner Asia and Siberia.

620. *COMPARATIVE SOCIAL AND POLITICAL ORGANIZATION*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 102, 103 or 411. M W F 12. Mr. SHARP.

The varied organization of human relations in selected cultures, both simple and complex, case studies of territorial, familial, clique, club, class, caste, and other bases of association and interaction; the definition and evaluation by comparison and contrast of democratic and other forms of group initiative and control.

622. *COMPARATIVE RELIGIOUS SYSTEMS*. Spring term. Credit three hours. M W F 12. Mr. ———.

Analysis of religions among selected non-Western societies; the role of religious behavior in cultural change.

[624. *COMPARATIVE ECONOMIC BEHAVIOR*. Fall term. Credit three hours. M W F 11. Mr. HOLMBERG. Offered in alternate years, not offered in 1956-1957.]

[*PRIMITIVE ART*. (See Fine Arts 204) Not offered in 1956-1957.]

*INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE*. (Linguistics 201-202.)

*LINGUISTIC ANALYSIS*. (See Linguistics 203-204.)

[*PHYSICAL ANTHROPOLOGY AND EVOLUTION*. (Zoology 222.) Not offered in 1956-1957.]

040. *INFORMAL STUDY*. Mr. SHARP.

050. *INFORMAL STUDY*. Mr. LEIGHTON, Mr. SMITH.

060. *INFORMAL STUDY*. Mr. ———.

070. *INFORMAL STUDY*. Mr. HOLMBERG.

## SOCIAL PSYCHOLOGY

*SOCIAL PSYCHOLOGY*. (Psychology 301.)

302. *SOCIAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisites, three hours in Psychology and three hours in Sociology and Anthropology or consent of instructor. M W F 12. Mr. ———.

An analysis of theories, concepts, and methods in social psychology with special emphasis on sociological and anthropological contributions to the field. Includes

such topics as development of the self, role learning and playing, role choice, effects of role on personality, social class and personality, communication, and leadership.

*This course constitutes the second half of a full-year sequence in social psychology. The first half is listed as Psychology 301. These courses may be taken separately.*

311. *PUBLIC OPINION*. Fall term. Credit three hours. M W F 11. Mr. SUCHMAN.

Factors determining the character of public opinion are analyzed on the basis of relevant social, psychological, and political science knowledge. The nature, development, and control of public opinion are examined in terms of opinion formation and change and the relation of public opinion to social and political action. Special emphasis is given to the techniques of propaganda, the functioning of pressure groups, and the role of the communication media of radio, press, and motion pictures in determining public opinion.

312. *MASS COMMUNICATION MEDIA*. Spring term. Credit three hours. M W F 11. Mr. W. THOMPSON.

Analysis of the mass media of communication—newspapers, radio, movies, magazines—within the framework of the concept of competition of ideas. The structure and control, audiences, and content of the mass media and their effects on public opinion and attitudes. Stress will be placed on the methods and techniques of media study.

[314. *COLLECTIVE BEHAVIOR AND SOCIAL MOVEMENTS*. Spring term. Credit three hours. Mr. STREIB. Not offered in 1956-1957.]

520. *INTERGROUP RELATIONS: PREJUDICE, DISCRIMINATION, AND CONFLICT*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101. M W F 10. Mr. SUCHMAN.

An evaluation of relations among ethnic, racial, and religious groups in terms of the social psychology of intergroup hostility and conflict and the position and role of these groups in the larger community. Prejudice and discrimination will be analyzed for their social, psychological, political, and economic causes and effects. Social and political movements based on intolerance and efforts to resolve intergroup conflict will be examined, with special attention to current developments resulting from the desegregation of public schools.

080. *INFORMAL STUDY*. Mr. SUCHMAN.

090. *INFORMAL STUDY*. Mr. ———.

## THEORY AND RESEARCH METHODS

201. *METHODS OF RESEARCH IN THE BEHAVIORAL SCIENCES*. Fall term. Credit three hours. Open to upperclassmen and graduate students. T Th 10 and a two-hour laboratory period to be arranged. Mr. SUCHMAN.

An introductory overview of the main methodological issues entailed in the planning and execution of empirical research in the social sciences, or in the critical evaluation of research reported in the literature. The emphasis will be on the level of research design and strategy rather than research techniques or tactics.

221. *SOCIAL THEORY*. Fall term. Credit three hours. Not open to sophomores. Required of all students majoring in Sociology and Anthropology. T Th 2-3:30. Mr. KAPLAN.

Survey of selected theories and concepts in contemporary sociology viewed in historical perspective, in relation to the contributions of other social sciences, and in terms of present-day developments in theory and research. Among the topics to be discussed are the following: values, social control, human groups, and anomie.

Throughout the course emphasis will be placed on trends in contemporary social theory.

222. *THE DEVELOPMENT OF SOCIOLOGICAL THOUGHT*. Spring term. Credit three hours. Open to seniors and graduate students. T Th 2-3:30. Mr. KAPLAN.

The study of the work of selected sociologists of the nineteenth and twentieth centuries, including Weber, Durkheim, Simmel, Cooley, W. I. Thomas, Mannheim, and others. The emphasis will be on significant antecedents of contemporary social theory.

[241. *FUNCTIONAL ANALYSIS OF SOCIAL STRUCTURES*. Fall term. Credit three hours. Open to upperclassmen and graduate students. Mr. KAPLAN. Not offered in 1956-1957.]

[242. *SPECIAL PROBLEMS IN SOCIOLOGICAL THEORY*. Spring term. Credit three hours. Open to seniors and graduate students. Prerequisite, Sociology and Anthropology 221-222 or equivalent. Mr. WILLIAMS. Not offered in 1956-1957.]

243. *THEORY OF CULTURE AND SOCIAL ORGANIZATION*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 221 or equivalent. T Th S 11. Mr. WILLIAMS.

Analysis of recent conceptual development in theories of cultural and social systems. Special attention will be given to the work of Talcott Parsons and associates, with comparative study of alternative conceptual schemes.

*LINGUISTIC FIELD METHODS*. (Linguistics 205.)

## HONORS PROGRAM

402. *HONORS SEMINAR*. Spring term. Credit three hours. Prerequisite, acceptance as candidate for Honors. Hours to be arranged. Mr. STREIB and STAFF.

403. *HONORS SEMINAR*. Fall term. Credit three hours. Prerequisite, acceptance as candidate for Honors. Hours to be arranged. Mr. STREIB and STAFF.

404. *HONORS SEMINAR*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 403. Hours to be arranged. Mr. STREIB and STAFF.

## GRADUATE SEMINARS

Primarily for graduate students, but may be taken by qualified undergraduates with consent of the instructor.

[275-276. *INTERVIEWING METHODS*. Throughout the year. Credit and hours to be arranged. Mr. DEAN. Not offered in 1956-1957.]

[277-278. *ANALYSIS OF SURVEY DATA*. Throughout the year. Credit and hours to be arranged. Mr. DEAN. Not offered in 1956-1957.]

375. *SOCIAL PSYCHOLOGY*. Spring term. Credit and hours to be arranged. Mr. ———.

377. *SOCIAL PSYCHOLOGY PROSEMINAR*. Fall term. Credit two hours. Prerequisite, consent of instructor. Hours to be arranged. Mr. ———.

[380. *COLLECTIVE BEHAVIOR*. Spring term. Credit and hours to be arranged. Mr. ———. Not offered in 1956-1957.]

385. *GROUP RELATIONS*. Spring term. Credit and hours to be arranged. Mr. WILLIAMS.

675-676. *ANTHROPOLOGICAL THEORY AND METHOD*. Throughout the year. Credit two hours a term. W 4-6. STAFF.



Fall term: history and theory. Spring term: field problems and methods.

680. *RESEARCH IN HUMAN RELATIONS*. Fall term. Credit and hours to be arranged. Mr. LEIGHTON.

682. *MIDDLE AND SOUTH AMERICAN ANTHROPOLOGY*. Fall term. Credit and hours to be arranged. Mr. HOLMBERG.

[683. *CULTURE AND CULTURE CHANGE IN INDIA*. Spring term. Credit and hours to be arranged. Mr. OPLER. Not offered in 1956-1957.]

[685. *SOUTHEAST ASIAN ANTHROPOLOGY*. Fall term. Credit and hours to be arranged. Mr. SHARP. Not offered in 1956-1957.]

[686. *CULTURE AND CULTURE CHANGE IN JAPAN*. Fall term. Credit and hours to be arranged. Mr. SMITH. Not offered in 1956-1957.]

693-694. *FIELD RESEARCH*. Throughout the year. Credit and hours to be arranged. FIELD STAFF.

A research seminar conducted in the field in the United States, Canada, Peru, India, or Southeast Asia for limited numbers of adequately prepared students.

## SPEECH AND DRAMA

Mr. H. D. ALBRIGHT, *Chairman*, Messrs. C. C. ARNOLD, HARRY CAPLAN, Mrs. A. L. COOPERSMITH, Messrs. G. P. CREPEAU, G. A. McCALMON, D. G. SCHAAL, W. H. STANTON, C. K. THOMAS, H. A. WICHELS, D. E. WILLIAMS, J. F. WILSON.

*Students may elect a general major, or a major with emphasis on (1) Public Speaking and Rhetoric, (2) Speech Training and Phonetics, (3) Dramatic Production. The following courses must be completed: (1) in the Department, twenty-seven hours; (2) in related subjects, six hours (not taken to meet the common studies requirements of the College) in each of the following groups: (a) Classics, English, Literature, Modern Foreign Literatures; (b) Economics, Government, History, Sociology; (c) Philosophy, Psychology. Of the total of forty-five hours in the major and related subjects, twenty-four must be in other than introductory courses. Beginning with the class of 1959, courses within the Department must include 105, 106, 333; for earlier classes, three hours from each of the following groups: 101 and 202; 121 and 141; 333.*

*Students registered jointly in Arts and Sciences and in Law must complete the following courses: (1) in the Department, twenty-one hours; (2) in related subjects, twelve hours.*

*Juniors and seniors majoring in the Department may, with the consent of the adviser, take informal study (in Public Speaking, 020; in Speech Training, 030; in Dramatic Production, 040).*

*Students planning to teach Speech should satisfy the basic requirements for teachers of English. For those preparing to teach English, the Department recommends fifteen to eighteen hours in Speech and Drama including Courses 101, 111 (or 141), 333, 401.*

\*105-106. *INTRODUCTION TO SPEECH AND THEATRE ART*. Throughout the year. Credit three hours a term; first term prerequisite to the second. Primarily for freshmen and sophomores. T Th S 10. First term, Messrs. THOMAS and ARNOLD; second term, Mr. ALBRIGHT.

An introduction to oral communication as a humane study, exploring the limitations and potentialities of speech, particularly in public address and the drama.

The first term includes an examination of language, voice, and action as instruments for the effective communication of thought and feeling, with special refer-

ence to rhetorical composition. The second term enlarges the scope of the basic material, developing speech and action as essential elements in dramatic communication and introducing such additional considerations as scenic design and space relationships within the playhouse.

Lectures, readings, discussions, and demonstrations. Not a practice course; no experience or previous instruction in speech making or dramatic production required.

## PUBLIC SPEAKING

101. *PUBLIC SPEAKING*. Either term. Credit three hours. Not open to freshmen. M W F 8, 9, 10, 11, or 12; T Th S 8, 9, 10, or 11. Messrs. ARNOLD, WICHELS, WILLIAMS, WILSON, and assistants.

Designed to help the student communicate his ideas and convictions effectively in oral discourse. Study of basic principles of expository and persuasive speaking, with emphasis on finding, evaluating, and organizing materials, and on simplicity and directness in style and delivery. Practice in preparing and delivering speeches of various types on current issues and in chairmanship; study of examples; conferences. The services of the Speech Clinic are available to those students who need remedial exercises.

Foreign students and others whose pronunciation of English falls below the normal standard, and students with special vocal problems, are advised to confer with Mr. Thomas before registering.

202. *PERSUASIVE SPEAKING*. Either term. Credit three hours. Prerequisite, Speech and Drama 101 or consent of the instructor. Fall term, M W F 9. Spring term, M W F 12 or T Th S 10. Mr. WILLIAMS and Mr. WILSON.

A consideration of the speech to convince. Special attention will be given to elementary psychological principles as affecting methods of persuasion. Practice in composition and delivery of persuasive speeches for various occasions; lectures, readings, conferences.

205. *DISCUSSION*. Spring term. Credit three hours. Not open to freshmen. M W F 9 or T Th S 9. Mr. ARNOLD and Mr. ———.

Study of the principles of systematic investigation and reflective thinking as applied to discussion. Practice in discussion of current problems by use of such forms as round table, panel, dialogue, case conference, committee, parliamentary, and lecture-forum.

213. *ARGUMENT*. Either term. Credit three hours. Prerequisite, Speech and Drama 101, or consent of the instructor. Fall term, M W F 12 or T Th 11-12:30. Spring term, T Th 11-12:30. Mr. WICHELS and Mr. WILSON.

Study of the principles of evidence and reasoning as applied in the discussion of public questions; investigation and analysis of issues, methods of proof and of refutation. Practice in construction and delivery of argumentative speeches; study of examples; conferences.

214. *ADVANCED ARGUMENT*. Spring term. Credit three hours. Prerequisite, Speech and Drama 213. M W F 12. Mr. WICHELS.

Advanced study of principles, types, and standards of reasoning on public questions. Practice in forensic and parliamentary debate and in cross-examination.

221. *FORMS OF PUBLIC ADDRESS*. Fall term. Credit three hours. Not open to freshmen. T Th 2-3:30. Mr. ARNOLD.

A study of the distinctive features of legislative, legal, ceremonial, campaign, and sermonical speaking. Speeches illustrating these forms of address will be drawn from the works of Burke, Erskine, Webster, Lincoln, Spurgeon, Darrow, F. D. Roosevelt,

Vandenberg, and, among contemporary speakers, the presidential candidates of 1956. Some practice in speech composition.

241. *PUBLIC OPINION AND THE METHOD OF ARGUMENT*. Spring term. Credit three hours.: Not open to freshmen. T Th 2-3:30. Mr. ARNOLD.

Critical study of the methods of persuasion exemplified in the discussion of contemporary issues. Lectures, readings, and reports on the theory of persuasion, the available grounds for argument and appeal in modern society, and the patterns of argument exemplified in current debates. Some practice in speech writing.

[275-276. *HISTORY OF PUBLIC ADDRESS*. Not offered in 1956-1957.]

[281-282. *BRITISH ORATORS*. Not offered in 1956-1957.]

[283. *AMERICAN ORATORS: 1640-1865*. Not offered in 1956-1957.]

284. *AMERICAN ORATORS: 1865-1956*. Spring term. Credit three hours. Not open to underclassmen except by consent of the instructor. M W F 10. Mr. ARNOLD and Mr. WILLIAMS.

Historical survey of the role of speech making in major attempts to influence public opinion in the United States since the Civil War. Consideration of the backgrounds, intellectual perspectives, and oratorical achievements of leading political leaders, preachers, lecturers, and agitators active in popular controversies of the period. Lectures, discussions, readings, independent research projects.

287-288. *THEORIES OF PUBLIC ADDRESS*. Throughout the year. Credit three hours a term. Primarily for graduates, open to upperclassmen by consent of the instructor. T 2-4:30. Mr. WICHELS.

An examination of ancient and modern theories on the nature and social function of advocacy and persuasion, the types of public address, and the speaker's problems of preparation, organization, style, and delivery.

290. *THESES AND SPECIAL PROBLEMS IN PUBLIC ADDRESS*. Either term. Credit three hours. Hours to be arranged. Mr. WICHELS and Mr. ARNOLD.

Open to graduate candidates working on theses and to other graduates prepared for independent study of special topics in rhetoric and public speaking.

[291-292. *RHETORICAL CRITICISM*. Not offered in 1956-1957.]

*The Department calls attention to three prizes in Public Speaking, competition for which will be open in the spring term: The Woodford Prize, for seniors; the Class of 1894 Memorial Prize in Debate, for juniors and seniors; and the Class of 1886 Memorial Prize in Public Speaking, for sophomores and juniors.*

## SPEECH TRAINING AND PHONETICS

\*131. *VOICE TRAINING*. Spring term. Credit two hours. Open to freshmen. Consult the instructor before registering. T Th 12. Mrs. COOPERSMITH.

An elementary course for the improvement of the speaking voice. Individual and group practice in overcoming such faults as nasality, weak quality, and indistinctness. Attention to the principles of voice production. Students with special vocal problems are advised to take this course before Course 101.

\*133. *TRAINING FOR STUTTERERS*. Fall term. Credit two hours. Open to freshmen. Hours to be arranged. Mrs. COOPERSMITH.

The nature of the problem; remedial treatment; conferences.

333. *ENGLISH PHONETICS*. Fall term. Credit three hours. Not open to freshmen. T Th 11-12:30. Mr. THOMAS.

Principles of phonetics; study of English pronunciation, based chiefly on con-

temporary American usage; practice in phonetic analysis, and, where necessary, drill for the improvement of individual speech.

334. *PRINCIPLES OF PHONETICS*. Spring term. Credit three hours. Not open to freshmen. T Th 11-12:30. Mr. THOMAS.

A study of the phoneme, sounds in combination, and sound change.

[336. *REGIONAL AND HISTORICAL PHONETICS*. Not offered in 1956-1957.]

[337. *HISTORICAL PHONETICS*. Not offered in 1956-1957.]

341. *FUNDAMENTALS OF SPEECH AND HEARING*. Fall term. Credit three hours. Not open to freshmen. T Th 2-3:30. Mrs. COOPERSMITH.

The structure and function of the speech and hearing systems. Physical, physiological, and psychological materials related to human speech.

[345. *SPEECH DEVELOPMENT IN CHILDREN*. Not offered in 1956-1957.]

351-352. *PRINCIPLES OF SPEECH CORRECTION*. Throughout the year. Credit three hours a term. T Th S 9. Mrs. COOPERSMITH.

Study of principles and methods, correlated with supervised practice in the Speech Clinic.

353-354. *PRINCIPLES OF SPEECH CORRECTION*. Throughout the year. Credit three hours a term. Prerequisite, Speech and Drama 352. Primarily for graduates. Hours to be arranged. Mr. THOMAS.

381-382. *GENERAL LINGUISTICS*. Throughout the year. Credit three hours a term. For graduates. Hours to be arranged. Mr. THOMAS.

390. *THESES AND SPECIAL PROBLEMS IN SPEECH TRAINING AND PHONETICS*. Either term. Credit three hours. Hours to be arranged. Mr. THOMAS.

Open to graduate candidates working on theses and to other graduates prepared for independent study of special topics in speech training and phonetics.

*SPEECH CLINIC*. For students working under the direction of the Department. Consult Mr. THOMAS or Mrs. COOPERSMITH.

## DRAMATIC PRODUCTION

111. *ORAL INTERPRETATION OF LITERATURE*. Fall term. Credit three hours. Not open to freshmen or to students who have taken Speech and Drama 141. M W F 9. Mr. SCHAAL.

Study, for understanding and appreciation, of poetry and prose selected from the best English and American writers; practice in reading aloud; conferences; drill.

141. *DRAMATIC INTERPRETATION*. Fall term. Credit three hours. Not open to freshmen or to students who have taken Speech and Drama 111. Prerequisite, consent of the instructor. T Th S 11. Mr. ALBRIGHT.

Analysis and interpretative reading of various types of dramatic prose and poetry; principles of stage presentation; reports, individual exercises, and group rehearsal.

401. *DRAMATIC PRODUCTION: DIRECTION*. Fall term. Credit three hours. For upperclassmen and graduates. M W F 11. Mr. STANTON.

Theory of stage direction; fundamentals of theatrical mounting; survey of practical phases of production. Lectures, exercises, and reports. Prerequisite for further work in dramatic production.

405. *ADVANCED DRAMATIC PRODUCTION: DIRECTION*. Spring term. Credit three hours. Open to upperclassmen by consent of the instructor. T 2-4 and an hour to be arranged. Mr. STANTON.

Readings, reports, and exercises in the direction and production of plays.

421. *ADVANCED DRAMATIC INTERPRETATION*. Spring term. Credit three hours. For graduates and, by consent of the instructor, for upperclassmen majoring in the Department. W 2-4:30. Mr. ALBRIGHT.

Varied projects in acting and group rehearsal, correlated with public presentations; individual drills, pantomimes, and reading exercises.

431. *DRAMATIC PRODUCTION: STAGECRAFT*. Fall term. Credit three hours. Open to upperclassmen by consent of the instructor. T Th 12. Laboratory, T 2-4:30. Mr. CREPEAU.

The theory and practice of stage production; planning of small theatres; stage arrangement; problems and practice in design, scene construction, and elements of lighting. Lectures, demonstrations, reports.

433-434. *THEATRE PRACTICE*. Throughout the year; may be entered either term. Credit two hours a term. Open by consent of the instructor to upperclassmen who have taken or who are taking Speech and Drama 141 or 401. Hours to be arranged. Mr. CREPEAU, Mr. McCALMON, and the Staff of the University Theatre.

Projects in the productions of the University Theatre.

437. *DRAMATIC PRODUCTION: STAGE LIGHTING*. Fall term. Credit three hours. T Th 11. Laboratory, Th 2-4:30. Mr. STANTON.

Light and color applied to theatrical production. Lectures, laboratory exercises, and reports.

439-440. *THEATRE PRACTICE*. Throughout the year; may be entered either term. For graduates. Hours and credits as arranged. Mr. CREPEAU, Mr. McCALMON, and STAFF.

451. *HISTORY OF THE THEATRE*. Fall term. Credit three hours. Open to upperclassmen. M W F 10. Mr. McCALMON.

The development of the theatre, with special attention to the period theatres and theatrical styles which influence modern stage presentation.

455. *AMERICAN DRAMA AND THEATRE*. Spring term. Credit three hours. Open to upperclassmen. M W F 10. Mr. McCALMON.

A study of the American theatre and of representative American plays, with emphasis on the drama as an experience of the national life and culture.

461-462. *PLAYWRITING*. Throughout the year. Credit three hours a term. First term is prerequisite to the second. F 2-4:30. Mr. McCALMON.

Dramatic theory and practice; three one-act plays will be written each term.

463-464. *PLAYWRITING*. Throughout the year. Credit three hours a term. Primarily for graduates. F 2-4:30. Mr. McCALMON.

475. *THEORIES OF DRAMATIC PRODUCTION*. Fall term. Credit three hours. Primarily for graduates; open to seniors by consent of the instructor. W 2-4:30. Mr. ALBRIGHT.

The chief theories of dramatic production in relation to aesthetic principles.

480. *THE MOTION PICTURE: A SURVEY*. Spring term. Credit three hours. T Th 11. Laboratory, Th 2-4:30. Mr. STANTON.

The development of the motion picture as a modern art. Characteristic problems and devices of the art; economic and social aspects; the documentary film; the educational film. Numerous films will be viewed; students are urged to attend the film programs of the University Theatre.

[481. *DRAMATIC ART*. Not offered in 1956-1957.]



485. *MODERN THEORIES OF STAGE PRESENTATION*. Spring term. Credit three hours. Primarily for graduates. Hours to be arranged. Mr. STANTON.

490. *THESES AND SPECIAL PROBLEMS IN DRAMA AND THE THEATRE*. Either term. Credit three hours. Hours to be arranged. Mr. STANTON, Mr. ALBRIGHT, and Mr. McCALMON.

Open to graduate candidates working on theses, and to other graduates prepared for independent study of special topics in drama and the theatre.

The Department calls the attention of students interested in Dramatic Production to the following courses: those listed under the Fine Arts; English 341, 369, 419, 470, 551-552; Literature 301-302; History of Costume (in the College of Home Economics). Additional opportunities for training, under the supervision of members of the Department, are available in the several divisions of the Cornell University Theatre.

Two prizes in playwriting are offered under the auspices of the Department in 1956-1957. The Heermans Prize for One-act Plays on an American Theme (open to undergraduates), and the Cornell Dramatic Club Prize (open to graduates and undergraduates, with no restriction as to theme). Also available through the University Radio Station is the WHCU Prize for Drama for the best original play (open to graduates and undergraduates), performed in conjunction with the University's annual Festival of Contemporary Arts.

The Drummond Awards, in honor of Professor Emeritus A. M. Drummond, aim to acknowledge each year outstanding achievements by undergraduate members of the Cornell Dramatic Club and other undergraduate participants in the University Theatre program.

## ZOOLOGY

Mr. H. B. ADELMANN, *Chairman*; Messrs. J. M. ANDERSON, L. C. COLE, P. W. GILBERT, S. L. LEONARD, H. A. SCHNEIDERMAN, M. SINGER, W. G. VANDER KLOOT, W. A. WIMSATT.

For a major in Zoology there must be completed: (1) Zoology 101-102, or 103-104, and twenty-four other hours selected from the following: Zoology 211-212, 224, 301, 302, 304, 401-402, 404, 451, 452, 454, 476 (two hours only), 491, 492, 494, 515-516, Conservation 8, Entomology 151 OR 152, and Plant Breeding (Genetics) 101; and (2) fifteen hours in related fields, selected from courses in Bacteriology, Biochemistry, Botany, Chemistry, Conservation, Entomology, Geology, Mathematics, Physics, Human Physiology, or Plant Breeding.

Introductory Zoology (Zoology 101-102), or General Zoology (Zoology 103-104), or the equivalent, is prerequisite to all courses in the Department and should be taken in the Freshman year if possible. For students planning to major in zoology a year of calculus is recommended.

Honors candidates must take at least nine hours of advanced and intensive Honors work (Zoology 050) under the supervision of an Honors adviser; of these nine hours not more than three may be counted toward the completion of the normal course requirements for a major in Zoology. During their final term Honors candidates will be required either to submit a creditable thesis or to pass a comprehensive examination. Prerequisites for admission to candidacy for Honors are a cumulative average grade of 80 in all studies and permission of the Honors adviser. Application for admission to Honors work should be made to Mr. Schneiderman, preferably early in the junior year.

Provisions are also made for a limited number of students who are not Honors candidates to undertake informal study (Zoology 040), which, however, may not be counted towards the completion of course requirements for a major in Zoology.

\*101-102. *INTRODUCTORY ZOOLOGY*. Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Intended for students in

Arts and Sciences. Zoology 101 prerequisite to Zoology 102. Lectures, T Th 9 or 12, Stimson G-25. Laboratory, M T W Th or F 2-4:20, or W 8-10:20, or F 10-12:20, or S 9-11:20, Stimson 102, 104, and 116. Mr. COLE and assistants.

An introduction to the fields of zoological study, designed both to provide a background for more specialized courses and to acquaint students in other fields with the fundamental facts about animal life. The principal divisions of the animal kingdom are surveyed with respect to similarities and differences in structure, function, behavior, and evolutionary history. The importance of other animals to man is emphasized. Both in the laboratory work and in lectures the student is introduced to representative types of animals and to the techniques by which man has acquired biological knowledge.

\*103-104. *GENERAL ZOOLOGY*. Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Intended for students in agriculture and home economics. Lectures, T Th 8. Laboratory, M T W Th or F 2-4:20; M 10-12:20; or S 9-11:20. Mr. LEONARD and assistants.

A survey of the various branches of the zoological sciences to serve as a background for advanced work in the study of animals. The principles of zoology will be illustrated by the study of representative animals with emphasis on those of economic importance to agriculture and to man. Emphasis will be placed on the biology of the vertebrates including the structural, functional, developmental, and genetic aspects.

201. *THE NATURE OF MAN: STRUCTURE AND DEVELOPMENT*. Fall term. Credit three hours. Not open to freshmen. Prerequisite, a laboratory science, preferably zoology or biology. Lectures, T Th 10; recitations, M 9, 10, 11, T 9, 11, W 8, 9, 10, 11, Th 8, 9, 11 or F 8, 9, 10, 11. Mr. SINGER and assistants.

The aim is to give the student an understanding of structure, function, and development of the human body.

*Zoology 201 is one of three interdepartmental courses dealing with the general topic of the nature of man from the perspectives of the biological and behavioral sciences. The other courses in the group are Psychology 203 and Sociology-Anthropology 204. The courses may be taken singly or in any order.*

211-212. *COMPARATIVE ANATOMY OF VERTEBRATES*. Throughout the year. Credit three hours a term. Prerequisite, Zoology 101-102, or 103-104, or the equivalent. In these prerequisite courses a student must have earned a grade of at least 75. Lecture, M 8 or 9. Laboratory, M F or T Th 2-4:30; W F or T Th 8-10:30; or W 2-4:30 and S 8-10:30. Mr. GILBERT and assistants.

A thorough study and dissection of representative vertebrate types, including fish, amphibian, reptile, bird, and mammal, together with demonstrations on species other than the types dissected. The course is intended to give students an evolutionary background for the study and appreciation of the structure of higher vertebrates, including man.

[222. *PHYSICAL ANTHROPOLOGY AND HUMAN EVOLUTION*. Spring term. Credit three hours. Lectures, M W F 12. Not offered in 1956-1957.]

224. *COMPARATIVE NEUROLOGY*. Spring term. Credit three hours. Enrollment limited to 22 students; permission of the instructor required. Prerequisites, nine hours of animal biology. Lectures, T Th 12. Laboratory, M or W 2-4:30. Mr. SINGER and assistant.

A comparative study of the vertebrate nervous system with emphasis upon the primate. Studies include dissections of the brain and the identification of nuclei and tracts in sections of the brain and spinal cord. Functional aspects of anatomical relations are stressed.

299. *HUMAN ANATOMY*. Hours and credit to be arranged. Open to a limited number of graduate students only. Permission of instructor required for registration. Mr. SINGER.

Detailed dissection of the human body with some emphasis upon function.

301. *HISTOLOGY: THE BIOLOGY AND DEVELOPMENT OF THE TISSUES*. Fall term. Credit four hours. Prerequisite, Zoology 101-102, or 103-104, and 211-212. Lectures, T Th 11. Laboratory, T Th 8-10:30 or 2-4:30. Mr. WIMSATT and assistants.

A survey of the structure and development of the tissues. The treatment is general, designed to provide students of biology with a basis for the understanding of normal and abnormal structure of the vertebrates. Each student will make for his own use a series of typical microscopic preparations.

302. *SPECIAL HISTOLOGY: THE BIOLOGY OF THE ORGANS*. Spring term. Credit four hours. Prerequisite, Zoology 301. Enrollment limited to 25 students. Lectures, W F 9. Laboratory, W F 2-4:30. Mr. WIMSATT and assistants.

A continuation of Zoology 301. Zoology 301 and 302 together give the fundamental facts of the microscopic structure and development of the body. There is also offered opportunity to gain knowledge of technique in the fixing, embedding, and sectioning of selected organs.

304. *VERTEBRATE EMBRYOLOGY*. Spring term. Credit five hours. Prerequisite, Zoology 101-102, or 103-104, and 211-212. Zoology 301 is also normally a prerequisite, and permission to omit it will be granted only in exceptional cases. Lectures, T Th 11, S 10. Laboratory, T Th 8-10:30 or 2-4:30. Mr. ADELMANN and assistants.

An introduction to general vertebrate embryology designed to provide a basis for the appreciation of biological problems. The material is treated comparatively with particular emphasis on the development of the amphibian, the bird, and the mammal. A few invertebrate forms are used where desirable for illustration.

305-306. *HISTOLOGY AND EMBRYOLOGY*. Throughout the year. For students of veterinary medicine only. Credit eight hours. Fall term: lectures, M F 12; laboratory, W F 2-4:30. Spring term: lectures, M F 9; laboratory, W F 10-1. Messrs. ADELMANN and WIMSATT.

The aim is to provide the student of veterinary medicine with a practical knowledge of the normal structure and development of the tissues and organs of the animal body by the direct study of them in the laboratory. The emphasis is on the domesticated animals of particular interest to the veterinarian.

[401-402. *ECOLOGY AND PHYSIOLOGY OF THE INVERTEBRATES*. Throughout the year. Credit three hours a term. Prerequisites, one year of general biology or introductory zoology. Organic chemistry and some college mathematics are desirable. Lectures, M W 11. Laboratory, W 2-4:30. Mr. COLE. Not offered in 1956-1957.]

404. *GENERAL ANIMAL ECOLOGY*. Spring term. Credit three hours. Prerequisites, Zoology 101-102 or 103-104, or their equivalent, and consent of instructor. Lectures, W F 10. A total of eight laboratory and field periods, S 8-1. Mr. COLE.

An introduction to the local and world-wide distribution of animals with reference to conditions of existence; effects of environmental factors on animals; adaptations to special habitats; modification of environment by animals; principles of population growth, composition, and density control. The adaptations of local animals to particular habitats will be studied in the field and laboratory.

451. *COMPARATIVE PHYSIOLOGY*. Fall term. Credit four hours. Prerequisites, one year of biology or zoology and college courses in chemistry. Organic chemistry

and comparative anatomy are also desirable. Lectures, M W F 9. Laboratory, M T W Th F 1:40-4:50, or S 8:00-11:10. Mr. SCHNEIDERMAN.

The principal physiological functions of both vertebrates and invertebrates, including muscle contraction, nerve action, respiration, metabolism, digestion, circulation, excretion, and physiological regulation.

452. *GENERAL AND CELLULAR PHYSIOLOGY*. Spring term. Credit four hours. Prerequisites, animal or plant physiology, organic chemistry, physics, and permission of the instructor. Biochemistry and histology, genetics or cytology are also desirable. Lectures, M W 12. Seminar and laboratory, T W or T Th 1:40-5:00. Mr. SCHNEIDERMAN.

An introduction to basic problems and methods of cellular physiology including physicochemical properties of protoplasm, function of cell organelles, role of nucleic acids, virus reproduction, permeability and active transport, growth, respiration, metabolism, and effects of ionizing radiation. The laboratory is designed to familiarize the student with basic techniques currently employed in physiological investigations, notably manometric and spectrophotometric methods, radioactive tracer technique, isolation of intracellular components, identification of enzyme systems, use of ultraviolet and x-irradiation, tissue culture, microsurgery, immunological methods.

454. *GENERAL AND CELLULAR PHYSIOLOGY LECTURES*. Spring term. Credit three hours. Prerequisite, Zoology 451 or equivalent, in which a student must have earned a grade of at least 80. Lectures, M W 12. Mr. SCHNEIDERMAN.

The lecture part of Zoology 452. Two term papers will be required.

476. *EXPERIMENTAL ENDOCRINOLOGY*. Spring term. Credit two or three hours. Prerequisites, a year of zoology, organic chemistry, physiology, and consent of instructor. Primarily for graduate students; open to undergraduates for two credits. Lectures, M F 11. Laboratory, M 2-4:30. Mr. LEONARD.

Lectures on anatomy, physiology of the vertebrate endocrine glands, glandular interrelationships; chemical and physiological properties of hormones, assay methods. Laboratory, small-animal surgery and microtechnique for the endocrines, illustrative experiments on the effects of hormones.

491. *EVOLUTIONARY ZOOLOGY*. Fall term. Credit three hours. Prerequisites, Zoology 101-102, or 103-104, and one year of college chemistry. M W F 10. Mr. VAN DER KLOOT.

An introduction to evolutionary thought designed as an integrating course for students of zoology and for other interested students. Covering Darwin and natural selection, the gene and variation in animals, the direction of evolution, the evolution of behavior, and the origin of life. The extension of the idea of evolution to the physical world will be briefly discussed.

492. *PHYSIOLOGY OF BEHAVIOR*. Spring term. Credit three hours. Prerequisite, Zoology 451. M W F 8. Mr. VAN DER KLOOT.

Designed to acquaint the student of zoology with the problem of behavior and its physiological basis. The comparative physiology of the sensory and nervous systems and the experimental study of the behavior of invertebrates and vertebrates.

494. *LABORATORY IN BEHAVIORAL PHYSIOLOGY*. Spring term. Credit one hour. Open to a limited number of students who are taking Zoology 492 concurrently. M or Th 2-4:30. Mr. VAN DER KLOOT.

An introduction to research techniques. Experiments in neurochemistry, electrophysiology, and the experimental analysis of behavior.

515-516. *INVERTEBRATE ZOOLOGY*. Throughout the year. Credit three hours a term. Prerequisites, Zoology 101-102 or 103-104, or equivalent, and consent of

instructor. Two laboratory periods a week, W and F 2-5; lecture once a week during laboratory period. Mr. ANDERSON.

Lectures on selected topics in the development, structure, function, and inter-relationships of invertebrate animals; laboratory work on related subjects, utilizing living specimens wherever possible. Particular attention is devoted to significant animal groups of uncertain taxonomic position.

040. *INFORMAL STUDY*. Ordinarily limited to seniors only. Credit and hours to be arranged. Problems may be undertaken in any phase of zoology, but the consent of the instructor concerned is a prerequisite.

050. *HONORS WORK IN ZOOLOGY*. Either term. Credit and hours to be arranged. Prerequisite, admission to candidacy for Honors in Zoology. Individual advanced work under the guidance of an Honors adviser, designed to increase the knowledge and experience of the candidate with the subject matter and the methods of research in some important phase of zoology.

## ADDITIONAL COURSES IN BIOLOGICAL SCIENCE

*These courses may be counted in the ninety Arts hours required for the A.B. degree.*

\**GENERAL BIOLOGY* (Biology 1, College of Agriculture). Throughout the year. Credit three hours a term. May be begun in either term. Not open to students who have had both Zoology 101-102 and Botany 1. If Botany 1 is taken after either Zoology 101-102 or Botany 1, credit two hours a term. Lectures and demonstrations, M W 9 or 11. Laboratory, M T W Th or F 2-4:20, or T 10-12:20. Mr. HOOD and assistants.

An elementary course planned to meet the needs of students majoring outside the plant and animal sciences; particularly adapted as the first year of a two-year sequence in biology for the prospective teacher of general science in the secondary schools. The nature of life, life processes, the activities and origin of living things; the organization of representative plants and animals, including man as an organism; and the principles of nutrition, growth, behavior, reproduction, heredity, and evolution.

*ELEMENTARY TAXONOMY AND NATURAL HISTORY OF VERTEBRATES* (Conservation 8, College of Agriculture). Throughout the year. Credit three hours a term. Prerequisites, Zoology 101-102, or 103-104, or Biology 1. Lecture, M 8. Laboratory, M W or T Th 2-4:30. Mr. HAMILTON and Mr. RANEY.

Lectures on fishes, amphibia, reptiles, birds, and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and bio-nomics of these groups. Laboratory practice in the identification of North American species. Field studies of the local fauna during the fall and spring.

*GENERAL ORNITHOLOGY* (Conservation 9, College of Agriculture). Spring term. Credit three hours. Open to all students. Lecture, M W 11. Field work and laboratory, W or Th 2-4:30. Mr. SIBLEY and assistants.

Introduction to the biology of birds; their structure, classification, adaptations for flight, migration, distribution, behavior, ecology, and evolution. Field and laboratory work on identification of local species. Field studies include two all-day field trips.

*INTRODUCTORY ENTOMOLOGY* (Entomology 10, College of Agriculture). Either term. Credit three hours. Open to all students. Lectures: fall term, W F 11; spring term, T Th 9. Laboratories: fall term, W Th F 2-4:30; spring term, M T W Th F 2-4:30. Mr. WATKINS and assistants.



A survey of the structure, biology, and classification of insects; types of insect control; and the major groups of insecticides, their formulation and application. Laboratory exercises on the anatomy and biology of insects, with practice in the identification of representative forms including many of the commoner species of economic importance.

\*303. *HUMAN PHYSIOLOGY*. Either term. Credit three hours. Prerequisite, a previous course, either in high school or college, in biology and in chemistry. Open to students in the Colleges of Arts and Sciences, Home Economics, and Agriculture, and to others. M W F 10. Mr. DYE and Mr. ADLER.

An introductory course designed primarily to present fundamental and practical information concerning the physiological processes and systems of the human body. Lectures, illustrations, and demonstrations.

305. *ENDOCRINOLOGY AND METABOLISM*. Fall term. Credit three hours. Prerequisites, six or more hours of biology, and a previous or parallel course in organic chemistry. Open to upperclassmen and graduate students. M W F 8. Mr. DYE.

A study of metabolism, endocrinology, and reproduction. Illustrated lectures.

## STATISTICS

Courses in statistics, both theoretical and applied, are offered in many of the departments of the schools and colleges on the campus. Among them are the departments of Agricultural Economics, Industrial and Engineering Administration, Mathematics, Plant Breeding, Psychology, and Sociology and Anthropology, and the School of Industrial and Labor Relations.

Of the courses in statistics offered by departments of other schools and colleges only the two listed below may be counted in the ninety Arts hours required for the degree of Bachelor of Arts.

*STATISTICAL REASONING* (Industrial and Labor Relations 210). Either term. Credit three hours.

*ECONOMIC AND SOCIAL STATISTICS* (Industrial and Labor Relations 211). Either term. Credit three hours.

## COURSES IN OTHER DIVISIONS

Courses of interest to students in the College of Arts and Sciences are offered by the Departments of Military Science and Tactics, Air Science, Naval Science, Physical Education, and Clinical and Preventive Medicine and are described in the *Announcement of the Independent Divisions and Departments*. Courses in other colleges and schools are described in their respective Announcements.



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