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BULLETIN OF YALE UNIVERSITY

UNIVERSITY CATALOGUE NUMBER

FOR THE YEAR

1954–1955

NEW HAVEN

1954

GENERAL STANDARDS

A STUDENT in good standing who at the end of a term has an average of 80 or better is placed on the Dean's Honor List the succeeding term.

The passing grade in a course is 60. To maintain good standing in his class the student must have passed all his courses in the preceding term and have attained a grade of 70 in at least 60 per cent of his work.

Promotion to Sophomore year: (1) To be promoted to the Sophomore class in June *in completely good standing* a student must have carried a full Freshman schedule, passed all his courses, and obtained quality credits (grades of 70 or better) in at least five of his term grades.

(2) A student who has failed to be promoted to the Sophomore class in completely good standing, as defined above, will be promoted in June provided he has carried a full Freshman schedule, obtained quality credits in five of his term grades, and has only one term grade below 60. Any student promoted with deficiencies in course credits or quality credits must consult at once with the Dean of Yale College and arrange to make up his deficiencies in one of the ways described below.

(3) A student who has failed to win promotion to the Sophomore class, and who has not been dropped from the Freshman class, should consult with the Dean of the Freshman Year immediately upon receipt of his final grades in June. Normally he will not be promoted in September unless he shall clear his deficiencies in one of the manners described below.

(4) If a student whose work is not entirely satisfactory is promoted to the Sophomore class, General Warning or other penalty will be imposed in accordance with the rules of Yale College.

Making up deficiencies: (1) Course Credits. A student with deficiencies in course credits is expected to make up his deficiencies in one of the following ways:

(*a*) by attending a summer session in an institution approved by the Dean, and securing a grade of at least 70 or C in a course or courses approved by the Dean;

(*b*) by re-examination in September in the course failed, if the *failing grade was a* 55;

(*c*) by passing in September an anticipatory examination in a course offered at Yale. Permission for this will be given only when a student has demonstrated in some of his Freshman courses his capacity to do superior work.

Quality Credits. A student with an insufficient number of credit grades may secure quality credits in one of the following ways:

by securing a grade of at least 80 or B in a course taken in session;

by receiving a grade of at least 70 on a make-up examination to retrieve a failure (see under *b* above);

by securing a grade of at least 70 on an anticipatory examination in a course offered at Yale (see under *c* above).

student may not be admitted to a particular department or field if his grades have been unsatisfactory in courses related to

credits. Grades of 70 or better secured on a make-up examination, or on an anticipatory examination, or grades of 80 or B courses in a summer session may be counted as quality

on to Junior year. No student may gain admission to the class and to the major field of study if he is deficient either or quantity in the work of the first two years. He is required that he has had two summers in which to repair his deficiencies. The minimum requirements for promotion to the Junior twenty term-course credits, or their equivalent, with grades better in at least ten term courses.

ements for graduation. To be recommended for the bachelor's degree a student must complete successfully the work of all terms and attain grades of 70 in at least 60 per cent of his total He must also attain at least six term grades of 70 in the work major field in his last four terms; pass the departmental examination or other work required in the field of his major or his and be recommended to the faculty by the department of and the Executive Committee of the College.

who have failed to meet the requirements for good in their respective classes at any marking period are placed General Warning until the next marking period. Notice of Warning will be sent to the parent or guardian.

dent who has dropped a course, or failed it with a grade below must clear his deficiency in the following summer by attending summer school or by passing an anticipatory examination in Only in cases where students have demonstrated quality records will an additional course in a later term be permitted to make up a deficiency. A student who has failed a term with a grade of 55 shall take a re-examination in that course arranged by the Dean's office. A grade of 60 in a re-examination

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will remove the course deficiency, and will restore the student to good standing in his class if all other requirements have been met.

Any student may be dropped from college after two Cuts, Warnings or when at the close of a term he has failed in two subjects.

While the normal time to be spent in the Standard Program for the bachelor's degree is four academic years, it is possible for the exceptional student who has met all the requirements for the degree in the basic studies, program of distribution, and major work to take the degree in three-and-one-half years. Normally, the student planning to take his degree in less than four years must have anticipated a portion of his requirements by excellent work in school and in his entrance examinations. Such students must, not later than the beginning of their third year in college, secure permission from the Dean to attempt early graduation.

ROTC credit. No credit will be given for ROTC courses taken in Junior and Senior years unless the student completes the course in both courses and accepts a commission at graduation if offered.

THE JUNIOR YEAR ABROAD

Upon recommendation of the Chairman of the department of the major and of the Chairman of the French or German or Italian department and with the consent of the Dean of Yale College, a student may arrange for a year's study in France, Germany, Switzerland, or Italy preferably at the Junior level but occasionally at the Sophomore level. No student will be allowed to spend his Senior year away from Yale.

This plan is not restricted to majors in language, but is intended for mature and responsible students interested in the language, history, and culture of France or Germany or Italy or who desire to specialize in such subjects as art, government, history, international affairs, music, philosophy, etc.

Candidates should have a minimum competence in the language equivalent to the completion of the Yale College modern language requirement with an honors grade. In order to secure permission for such study abroad they must submit in the preceding spring a plan of study and, as soon as possible, evidence of acceptance by a recognized educational institution abroad or the regularly organized Junior Year in Paris sponsored by the Institute of International Education and Sweet Briar College. The amount of credit to be allowed the student toward his degree will depend upon his success in carrying his plan to a satisfactory completion. To

toward his degree at Yale the student must submit a transcript of his record during his year away.

for summer study abroad sponsored jointly by Yale and in Paris, including supervised courses in French Language literature, History of Art, or International Relations, is open qualified students.

admission to the Junior Year Abroad in France or the Summer consult Mr. G. C. May, 321 WLH; for the Junior year in , consult Mr. Nordmeyer, 307 WLH; for the Junior year in consult Mr. Bergin, Master's Office, TD.

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CHARTS FOR B.S. PROGRAMS

THE charts on the following pages present graphically the [illegible] four-year program in each of the major fields of study leading to the degree of Bachelor of Science.

BIOLOGY: PROGRAM IN PLANT SCIENCE

Freshman year	*Sophomore year*	*Junior year*	*Senior year*
Biol. 11 or Science III*	Biol. 28a Pl. Sci. 21b	Pl. Sci. 31b	Pl. Sci. 45
Chem. 12 or 14*	Pl. Sci. 22	Zool. 37a‡ or Pl. Sci. 33b‡	Pl. Sci. (3 terms)
Math. 11 or 12*†	Distribution*	Chem. 33	Elective
Engl. 10 or 15*†	Distribution*	Distribution*	Elective
Mod. Lang.*†	Elective§	Elective Elective	Elective

BIOLOGY: PROGRAM IN ZOOLOGY

Freshman year	*Sophomore year*	*Junior year*	*Senior year*
Biol. 11 or Science III*	Zool.	Zool.	Zool. Zool. 45
Chem. 12 or 14*	Phys. 11 and 12*	Chem. 33 and 33L	
Math. 11 or 12†	Distribution* Distribution*	Distribution*	
Engl. 10 or 15*†		Elective	Elective Elective
Mod. Lang.*†	Elective	Elective	Elective

*Degree requirements. See pp. 2–4.

†May be anticipated by excellent work in secondary school. See pp. 18–19.

‡In special cases other courses in plant science may be substituted, and zoology or genetics elected in the Senior year.

§If physics has not been anticipated at entrance, this elective must be Physics 11 and 12.

||Required for the major.

BIOLOGY: PROGRAM IN GENERAL BIOLOGY

Freshman year	*Sophomore year*	*Junior year*	*Senior year§*
Science III* or Biol. 11	Pl. Sci. (an "a" course) and Biol. 20b	Pl. Sci. Zool.	Pl. Sci. Zool.
Chem. 12 or 14*			
Math. 11 or 12*†	Phys. 11 and 12† Chem. 33	Distribution*	
		Elective	Elective
Engl. 10 or 15*†	Distribution*		Elective
Mod. Lang.*†	Distribution*	Elective	Elective

BIOLOGY: PROGRAM IN MICROBIOLOGY

Freshman year	*Sophomore year*	*Junior year*	*Senior year*
Biol. 11 or Science III	Chem. 26a Biol. 28a	Microbiol. "a" or "b"||	Microbiol. "a" or "b"||
Chem. 12 or 14*	Phys. 11 and 12*†	Chem. 33 and 33L	Microbiol. 45 Adv. Chem.
Math. 11 or 12*†	Distribution*	Zool. 30b or Pl. Sci. 31b	Elective
Engl. 10 or 15*†	Distribution*	Zool. 37a‡ or Pl. Sci. 33b‡ Distribution*	Elective
		Elective	
Mod. Lang.*†	Elective	Elective (1 term)	Elective (1 term)

*Degree requirements. See pp. 2–4.

†May be anticipated by excellent work in secondary school. See pp. 18–19.

‡In some cases, modern language may require an additional two terms of study. In special cases some other course in plant science or zoology may be substituted, and genetics or cytology taken in the Senior year.

§Biology 45 must be included in the Senior year.

||Chosen from Plant Science 36b or 38a or Microbiology 40a.

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BIOCHEMISTRY

Freshman year	Sophomore year	Junior year	Senior year
Chem. 12 or 14*	Chem. 27	Chem. 33 and 33L or Chem. 35 and 35L	Chem. 34 and 34L
Biol. 11 or Science III*	Math. 21 or 25	Microbiol. 40a	Biochem. 100a and 100b
Math. 11 or 12*†	Phys. 22 and 23*	Zool. 30b	Biochem. 102
Engl. 10 or 15*†	Distribution*	Distribution*	Elective (1 term)
Mod. Lang.*†	Distribution*	Elective	Elective
		Elective	Elective

COMBINED BIOLOGICAL AND MEDICAL STUDIES

Freshman year	Sophomore year	Junior year	Senior year
Biol. 11 or Science III*	Zool.	Zool.	Taken in Medical School
Chem. 12 or 14*	Phys. 11 and 12*	Chem. 33 and 33 L	
Math. 11 or 12*†	Distribution*	Distribution*	
Engl. 10 or 15*†	Distribution*	Elective	
Mod. Lang.*†	Elective	Elective	

*Degree requirements. See pp. 2–4.
†May be anticipated by excellent work in secondary school. See pp. 18–19. In some cases, modern language may require an additional two terms of study.
‡To qualify for the B.S. degree, a student must have a satisfactory record in his class at the end of the first year in medical school.

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CHEMISTRY

Freshman year	Sophomore year	Junior year	Senior year
Chem. 12 or 14*	Chem. 27	Chem. 33 and 33L or Chem. 35 and 35L	Two courses selected from Chem. 41, 45, 47
Math. 11 or 12*†	Math. 21 or 25	Chem. 34 and 34L	Chem. 44a and b or Chem. 44a and 42b
Engl. 10 or 15*†	Phys. 22 and 23*	Distribution*	
Mod. Lang.*†	Distribution*	Elective	Elective
Distribution*	Elective	Elective	Elective

GEOLOGY

Freshman year	Sophomore year	Junior year	Senior year‡
Geol. 10	Geol. 12a and 21b	Geol. 30	Geol.
Chem. 12 or 14*†	Phys. 11 and 12*† or 22 and 23	Geol. 35a and a "b" course	Geol. Science other than Geology
Math. 11 or 12*	Distribution*	Distribution*	
Engl. 10 or 15*†	Distribution*	Elective	Elective
French or German*†	Elective	Elective	Elective

*Degree requirements. See pp. 2–4.
†May be anticipated by excellent work in secondary school. See pp. 18–19. In some cases, modern language may require an additional two terms of study.
‡To be excused by special permission, students are expected to take a summer field course in geology, such a course counting as one of the five year courses in geology (beyond Geology 10) that compose the major.

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MATHEMATICS

Freshman year	*Sophomore year*	*Junior year*	*Senior year*
Math. 11 or 12*†	Math. 21, 23, or 25	Math.	Math.
Chem. 12*†	Phys. 11 and 12*†	Math.	Math.
Engl. 10 or 15*†	Distribution*	Distribution*	Math. or Science
Mod. Lang.*†	Distribution*	Elective	Elective
Elective	Elective	Elective	Elective

PHYSICS

Freshman year	*Sophomore year*	*Junior year*‖	*Senior year*
Chem. 12 or 14*†	Phys. 22 and 23*§	Phys. 31	Three courses, each term, selected from Phys. 32a, 36b, 37a, 38a, 39b, 41a, 42b, 45, 50
Math. 11 or 12*†		Phys. 40	
Engl. 10 or 15*†	Math. 21, 23, or 25	Math. 30 or 46	
Mod. Lang.*†	Distribution* Distribution*	Distribution*	Elective
Elective	Elective	Elective	Elective

*Degree requirements. See pp. 2–4.
†May be anticipated by excellent work in secondary school. See pp. 18–19.
In some cases, modern language may require an additional year of study.
‡A Senior essay, or seminar, at the option of the department may be substituted for the equivalent of a year course in the major in Senior year.
§May be taken in Freshman year if Mathematics 21, 23, or 25 is taken currently.
‖Substitution of other physics courses is sometimes desirable.

BIOPHYSICS

Freshman year	*Sophomore year*	*Junior year*	*Senior year*
Lang.*†	Math. 21 or 25	Physics	Biology or Physics
10 or 15*†	Phys. 22 and 23*	Biology‡	Phys. 45 (Biophysics)
11 or III	Distribution*	Chem. 33 or 35	Chem. 34
11 or 12*†	Distribution*	Elective	Distribution*
14*	Elective	Elective	Elective

*Degree requirements. See pp. 2–4.
†May be anticipated by excellent work in secondary school. See pp. 18–19.
In some cases, modern language may require an additional two terms of study.
‡Biology implies an option in zoology or plant science.

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promotion, as outlined in the preceding paragraph, either with respect to course credits, or to quality credits, or to both, and who has not been dropped from the Freshman year, should consult the Dean of Freshmen. If not promotable in June, he may be promoted in September if he shall clear his deficiencies in one of the manners prescribed.*

Freshmen should note that one of the requirements for all undergraduate degrees is that quality credit grades be secured in 60 per cent of all courses required for the degree.

If a student whose work is not entirely satisfactory is promoted to the Sophomore class, General Warning or other penalty will be imposed in accordance with the rules of the school in which he will be registered.

YALE COLLEGE†

WILLIAM CLYDE DEVANE, PH.D., LITT.D., LL.D., Dean.
RICHARD CUSHMAN CARROLL, M.A., Associate Dean.
LEWIS MERRIAM WIGGIN, PH.D., Assistant Dean.
RONALD CHARLES MARSH, B.A., Registrar.

YALE COLLEGE offers courses of study in the liberal arts and sciences leading to the degrees of Bachelor of Arts (B.A.) and Bachelor of Science (B.S.). The two requirements of a liberal education are the achievement of a liberal breadth, and the mastery of a particular study or group of studies. The work of Sophomore year is designed to carry on work begun in Freshman year and to introduce the student to new fields of study. In Junior and Senior years opportunity is provided for a greater degree of concentration in a subject or in a field of major interest, the student's comprehension of which is tested by his independent work in the field during his last two years and by a departmental or comprehensive examination at the close of his Senior year.

COURSES OF STUDY

Each program of courses for the B.A. or B.S. degree must provide first of all for the fundamental studies and the breadth of distribution which are essential to a well-rounded education and basic to sound progress and concentration in the major field. To qualify for the degree the student must satisfy the requirements of the faculty

*The ways in which deficiencies may be cleared are described in *The Freshman Year Rules for Attendance, Scholarship, and Conduct*. A copy of this pamphlet is given to each Freshman.

†The *Undergraduate Courses of Study* bulletin lists the individual courses and hours of subjects of instruction open to undergraduates.

under these several heads: (1) Basic Studies; (2) Program of Distribution; (3) Requirements of Major Programs; (4) Reading Program. The first two of these requirements may be met either through the Standard Program or through the Program of Directed Studies. The latter program, described on pages 105–106, is limited to men chosen from those students who apply for it at the beginning of Freshman year. The group chosen will represent a cross section of the class.

1. BASIC STUDIES (STANDARD PROGRAM)

The liberal education of the student is grounded upon the assumption that there are certain techniques and abilities essential to further progress in learning. The student should possess before his entrance into college (or at the latest at an early stage in his college career) the ability (*a*) to read and write English with facility and accuracy—in which the study of Latin and Greek are powerful aids, (*b*) to use a modern foreign language with some ease, (*c*) to think and reason clearly and logically, and (*d*) to understand how modern science applies logical reasoning to natural phenomena. The candidate usually has taken work in school conducive to proficiency in each of these four essential points, and his school work has been at some points validated by College Entrance Examination Board tests. Unless the student is specifically exempted by his achievement he is expected to satisfy these four basic requirements by taking in college a year course, or the equivalent, from each of the following groups:

I. *English:*
English 15* or Latin 22 or 25 or Greek 22 or 25

II. *Modern Language:*
French, German, Italian, Portuguese, Russian, or Spanish at a level of 22 or higher.† In intensive language courses, numbered 25, the student must obtain a grade of 80 to satisfy this requirement.

III. *Formal Thinking:*
1. Mathematics 11, 12,‡ or 16 *or*
2. Philosophy 10a or 11a and any one of the following second-term courses: Philosophy 12b or 13b or 15b *or*
3. Linguistics 20.

*English 10 may satisfy the requirement for B.A. candidates on special recommendation of the instructor; for B.S. candidates only if followed by English 24 or 27.

†If the student wishes to satisfy the requirement in modern language through another European language or through an Oriental language he must secure the permission of the Dean. Except by special permission of the department concerned, only French or German will satisfy this requirement for B.S. candidates.

‡Mathematics 11 or 12 is required of all candidates for the B.S. degree.

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IV. *Laboratory Science:**
Science II, III; Chemistry 11, 12, or 14; Geology 10 or 12a and 12b; Physics 12 and 11; Biology 11.

These requirements may be anticipated by excellent work in school and validating scores on the appropriate tests of the College Entrance Examination Board. See the Schedule of Exemptions, pages 106–107.

2. PROGRAM OF DISTRIBUTION

The purpose of the program of distribution is to provide the student with a broad view of the world he lives in and to equip him with the means of understanding it. This entails a knowledge of inanimate and animate nature through the appropriate sciences, a large view of man in the perspective of time, an acquaintance with the great ideas which have influenced the actions of men in the past, and continue to do so in the present, and a knowledge of the significant institutions of modern society. It also entails a comprehension of the arts, the ideas, and the aspirations of men. To obtain so large a view in all its fullness is properly the occupation of a lifetime. Practical considerations compel the division of knowledge into certain large and reasonably well-defined areas.

To lay strong foundations and to ensure a comprehensive view the College requires every student to elect a full-year course or two term courses in the same subject in four of the groups numbered from I to V below:

I. The Classical Languages, Literature, and Civilization.†
The Judaeo-Christian Tradition in Western Civilization.†

II. Modern Literature,‡ the Fine Arts, and Music.

III. Anthropology, Economics, Geography, Political Science, Psychology, Sociology.

IV. History, Philosophy, Religion.

V. Natural or Physical Science.§

*For students contemplating a B.S. degree, Chemistry 12 or 14 is strongly recommended for Freshman year and, in most cases, required. No candidate for the B.S. degree may be exempted from a college course in laboratory science. If he qualifies for an "exemption" at the time of admission, he may elect an advanced course in the same science as an alternative to the election of a new science from those listed.

†Courses in Latin or Greek at the level of 22 or above or two term courses in classical civilization (including Religion 10b).

‡Courses in English above 15 or in the modern foreign languages above 39 when such courses are literary rather than linguistic. Candidates for the B.S. degree will ordinarily satisfy this requirement by English 24 or 27.

§Candidates for the B.S. degree must elect a course from this group, which will normally be the course in physics required for their prospective major.

The same course may not satisfy more than one degree requirement. No student will be promoted to the Junior class who has not completed all of the basic requirements and at least two of the distribution requirements.

3. REQUIREMENTS OF MAJOR PROGRAMS

At the end of Freshman year, students will choose the degree for which they wish to qualify. Those seeking the B.S. degree in Yale College will elect their majors at this time. Those entering the B.A. program will postpone the election of their major until the end of Sophomore year.* All candidates for a bachelor's degree in Yale College must elect one of the major programs in the list on page 102. In every case the student shall plan his schedule of courses in his subject or field in consultation with a representative of the department or program concerned, and must secure the consultant's written approval before the schedule is handed in. The student should acquaint himself fully with all the requirements of the major he plans to enter, with regard not merely to his immediate choice of courses but to the plan of his entire work in his last two or three years in college.

Candidates preparing themselves for entrance to medical school must elect a major in an approved Departmental or Divisional Program. In addition, their programs must include Physics 11 and 12, Chemistry 12 or 14 and Chemistry 33 and 33L, Biology 11, or equivalents. Students contemplating graduate work should inquire concerning the language requirements of the subject in which they are interested. Normally, a reading knowledge of both French and German is required of candidates seeking a Ph.D. degree.

Every program in Junior year shall consist of five full courses; in Senior year each B.A. program shall consist of four full courses with the fifth part of the student's time allocated to preparation for the departmental or comprehensive examination. All B.S. programs shall consist of five full courses.

THE DEPARTMENTAL MAJOR (B.A. OR B.S.)

The major consists of the equivalent of six year courses in a single subject, normally taken, with the exception of the prerequisite, during Junior and Senior years. B.A. candidates, who take only four courses in Senior year, will be limited to five formal courses in the major subject, the equivalent of a sixth course being represented

*Students intending to major in architecture and to take the combined six-year curriculum offered in conjunction with the School of the Fine Arts should have arrived at this decision by the end of Freshman year.

MAJORS IN YALE COLLEGE*

Departmental Majors Leading to B.A. Degree
American Studies
Anthropology
Architecture
Classical Civilization (Ancient History)
Classics (Greek and Latin combined)
Design (Painting, Sculpture, Graphic Arts)
Drama
Economics
English
French
German
Greek
History
History of Art
Italian
Latin
Mathematics
Music (History or Theory and Composition)
Philosophy
Political Science
Psychology
Religion
Sociology
Spanish

Departmental Majors Leading to B.S. Degree
Chemistry
General Biology
Geology
Mathematics
Microbiology
Physics
Plant Science
Zoology

Divisional Majors Leading to B.A. Degree
History, the Arts, and Letters
Political and Economic Institutions: Their History, Philosophy, and Analysis
Human Culture and Behavior
Special Divisional Majors†

Divisional Majors Leading to B.S. Degree
Biochemistry
Biophysics

Special Majors Leading to B.A. Degree
Mathematics and Philosophy
Physics and Philosophy
Foreign Area Studies
Chinese Studies
Japanese Studies
Russian Studies
Southeast Asia Studies
Scholars of the House

by the time allocated to preparation for the departmental examination. One of the major courses may, with the advice and approval

*These majors are described in detail in the *Undergraduate Courses of Study* bulletin.

†Special Divisional Majors are planned to meet particular needs of students, including those enrolled in one of the ROTC programs or meeting premedical requirements.

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of the department, be an advanced course in a related subject. The major may also include one prerequisite course, commonly taken during the first two years. Qualified candidates may take one of the six major courses during Sophomore year.

Students taking the Departmental Major will be excused from examinations in the courses of their major subject for the second term of Senior year, but will be required to pass a departmental examination in order to qualify for the degree.

For B.A. candidates, the Departmental Major may be either Standard or Intensive. In the Intensive phase, at least one of the courses must be a discussion course. The student in the Intensive Major must write a Senior essay. The essay shall count as one of the courses in the major in Senior year. Only students in the Intensive phase of the B.A. Departmental Majors shall be considered for departmental honors. In the B.S. Departmental Majors, no distinction between Standard and Intensive is made, but a student must write an essay or do other independent work in order to qualify for departmental honors.

THE DIVISIONAL MAJOR (B.A.)

The Divisional Majors listed on page 102 are offered to students who wish to elect broader programs of study in their last two years of college than the Departmental Majors allow. The over-all program of the student shall consist of five year courses, or their equivalent, in Junior year, and four in Senior year with the fifth part of the time allocated to preparation for the comprehensive examination at the end of Senior year. In the Divisional Major itself no precise number of courses is prescribed, and no particular courses are prescribed, except that specified seminars are required to aid in the integration of the work of the major. To make sure that the major is genuinely divisional in its scope, the student may not take more than four courses during his Junior and Senior years in a single subject, and will normally choose one elective outside his Divisional Major.

As in the Departmental Major, the Divisional Majors offer both Standard and Intensive programs. The task of the student in either phase is to prepare himself through his courses and his reading to take a comprehensive examination at the end of his Senior year. These examinations will consist of essay questions. The student in the Intensive Divisional Major will write during his Senior year an essay which shall count as one of his four Senior courses. Only those students in the Intensive phase of the Divisional Majors are eligible for departmental honors.

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[*Latin* 38, *Roman Law.* Mr. Bellinger.
Omitted 1954–55; offered

[*Latin* 40, *Latin Literature of the Republic.* Mr. F. E. Brown.
Wide reading in both prose and poetry. A survey of the
Roman literature from Livius Andronicus to Horace.
Omitted

Latin 41, *Latin Literature of the Empire.* Mr. R. R. Porter.
T, Th, S, 11.10.
Wide reading in both prose and poetry. A survey of the
Roman literature from Ovid to Apuleius.

[*Latin* 42, *Latin Literature of the Later Empire and Middle Ages.*
Omitted 1954–55; offered

★*Latin* 45, *Special Reading* (*Discussion Courses*).
Hours to be arranged.
For students who desire upper-class work in Latin, including
who wish to major in Latin, special courses of reading or
study will be arranged to be pursued under such supervision
required. Such reading may cover the work normally done in the
courses listed above. Consult Mr. Dawson.

NOTE: For courses in classical civilization, ancient history and
see pages 67–69.
Properly qualified undergraduates may, with the consent of the
partment and of the dean concerned, be admitted to certain
courses in Latin. See the bulletin of the Graduate School.

LINGUISTICS

Linguistics 20, *The Structure of Language.* Mr. Bloch.
M, W, F, 1.45.
English and other languages are presented as objects of
sis, with emphasis on the discovery of formal units and
guistic behavior. Orientation: the social setting of language
and dialect; the problem of correctness; the relation of speech
ing. Phonetic structure: the phonemic principle. Morphologi
tactic structure. Satisfies the group requirement in Formal

MALAYAN

(*See under Indic and Far Eastern Languages and Literatures*)

MASTER OF ARTS IN TEACHING

THE Master of Arts in Teaching program is a liberal arts
uate and graduate program for the preparation of high-school

sponsored and conducted jointly by the various academic depart-
for the purpose (1) of emphasizing academic competence by
that a student take, under the direction of the academic
ment or departments concerned, a minimum of two full-year grad-
courses over and above the undergraduate major in the subject or
he proposes to teach; and (2) of effecting a closer integration
a student's undergraduate preparation, especially in his last two
and the fifth or graduate year. See the pamphlet, *Master of Arts*
ching.
er of Arts in Teaching ★51 and ★52 are designed primarily for
registered in the program leading to the degree of Master of
Teaching.

7. 51, *Basic Concepts and Issues in Education I.* Mr. Brubacher
others. (6)
F, 1.45–3.45.
ination of basic educational problems, especially in secondary
on, from the point of view of their historical, anthropological, and
gical foundations. *Open to Juniors.*

7. 52, *Basic Concepts and Issues in Education II.* Mr. Brubacher
others. (12)
Th, 1.45–3.45.
ination of basic educational problems from the point of view of
ional psychology and educational philosophy.

the permission of the director of the program, properly qualified
raduates may be admitted to graduate courses in the program.

MATHEMATICS*

DATES for the B.A. or the B.S. degree electing to major in mathe-
should note the following paragraphs.
requisites. Mathematics 11 or 12 and 21, 23, or 25, or the equivalent.
omores and Juniors will consult at once with a member of the
ng committee: Mr. E. J. Miles, 741 JE, *chairman;* Mr. Dunford,
LOM; Mr. Begle, 207 LOM.
major. The major in mathematics will normally consist of ten
courses in mathematics to be chosen from those open to under-
ates and numbered 30 or higher. Each student shall take at least
m courses in three of the four fields: Algebra (Mathematics 50,
5b, 56b, 58a), Analysis (Mathematics 30, 32, 34a, 36b), Applied
matics (Mathematics 42, 44a, 46), and Geometry (Mathematics 60a,
a, 66b). In some instances permission may be granted to take some of
equired term courses in related fields. NOTE: Mathematics 62 and
combination Mathematics 64a and Mathematics 66b will alternate,
ng given each year.

* paragraph 9, p. 48, in regard to graduate courses.

M

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1954-55

Qualified students majoring in mathematics may, with the approval of the department, write a Senior essay. They must submit with their request a statement in writing from the member of the department who is to supervise the work. A student who does not write a Senior essay must take three courses each term in mathematics during the Senior year.

See also Philosophy 45b, Philosophy of Mathematics.

NOTE: Qualified Sophomores may, with the permission of the instructor, take any of the following courses numbered 30 or above.

Mathematics 11, *Mathematical Analysis.* Mr. Hedlund.

1. M, W, F, 9.10.
2. M, W, F, 10.10.
3. T, Th, S, 8.
4. T, Th, S, 11.10.

For students who have not passed trigonometry for entrance. Trigonometry and the elements of analytic geometry and calculus.

Mathematics 12, *Analytic Geometry and Calculus.* Consult Mr. Begle.

1, 2. M, W, F, 8.
3, 4. M, W, F, 9.10.
5, 6. M, W, F, 10.10.
7, 8. M, W, F, 11.10.
9, 10. M, W, F, 12.10.
11, 12. T, Th, S, 8.
13, 14. T, Th, S, 9.10.
15, 16. T, Th, S, 10.10.
17, 18. T, Th, S, 11.10.

For students who have passed trigonometry for entrance. An introductory course in the fundamental ideas of the differential and integral calculus. A sufficient amount of analytic geometry for the purpose included.

[**Mathematics* 14, *Mathematics for Architects.* Mr. ——.

The purpose of this course is to familiarize the student with the fundamentals of plane trigonometry, analytic geometry, and calculus. Throughout the course considerable emphasis is laid on applications to architecture and design. *For students of architecture. Open to undergraduates with permission of the department.* Consult Mr. Begle.

Not offered 1954-55.]

Mathematics 16, *Elementary Analysis, Probability, and Statistics.* Mr. Votaw.

M, W, F, 11.10.

Elementary analysis, probability, and statistics. An introduction to statistical method for those who intend to major in a social or biological science. The elementary mathematics needed is given in the course.

NOTE: Mathematics 16 does not prepare for later work in the Sheffield Engineering or for advanced courses in mathematics or in the physical sciences. The second term may be taken independently for credit if the student has the equivalent of the first term.

Mathematics 21, *Calculus* (*continued*). Consult Mr. Rickart.

1, 2. M, W, F, 9.10.
3, 4. M, W, F, 10.10.
5. M, W, F, 11.10.
6. T, Th, S, 10.10.
7. T, Th, S, 11.10.

...s from analytic geometry and calculus, including infinite series, ...ordinates, differential equations, differentiation and integration ...ions of several variables. *For students in chemical, civil, electri-... mechanical engineering, chemistry, and metallurgy who have ... Mathematics* 12 *or the equivalent.*

...*matics* 23, *Second-Year Mathematics.* Mr. ——. (19)

M, W, F, 12.10.

...tinuation of calculus, including the study of theory and technique, ...pplications in geometry and the physical sciences. *After Mathe-... 11 and, with the consent of the instructor, Mathematics* I.

...*matics* 25, *Sophomore Mathematics.* Consult Mr. Dunford. (19)

1. M, W, F, 11.10. 2, 3. T, Th, S, 9.10.

...course covers essentially the topics treated in Mathematics 21 but ...more emphasis on the fundamentals and with further applications ...ics and philosophy, including motion under a central force, Kep-...s of planetary motion, the simple pendulum treated with elliptic ..., and a brief discussion of Laplace's theory of determinism. *For ...ores who have passed Mathematics* 12 *or the equivalent.*

...*matics* 25.

...54-55 College Discussion Groups for Sophomores in Mathematics ... be available as follows:

Timothy Dwight, Mr. Bernard

...*matics* 34a, *Differential Equations.* Mr. Kakutani. (5)

M, W, F, 12.10.

...ry of differential equations, ordinary and partial, with emphasis ...ear equations of the second order. *After Mathematics* 30, 32, *or* 46.

...*matics* 36b, *Functions of a Complex Variable.* Mr. Kakutani. (5)

M, W, F, 12.10.

...duction to the theory of functions of a complex variable. *After ...matics* 30, 32, *or* 46.

...*matics* 42, *Statistics.* Mr. Votaw. (2)

M, W, F, 9.10.

...uency distributions, computation of statistical parameters, normal ... least squares, curve fitting, testing of goodness of fit, sampling ... for large and small samples, correlation theory in two and sev-...ariables, testing of statistical hypotheses, design in experiments. *Pref-... after Mathematics* 21, 23, *or* 25; *also open to Sophomores after ...matics* 12.

...*matics* 46, *Higher Mathematics for Students of Science and En-...neering.* Mr. ——. (19)

1. M, W, F, 11.10. 2, 3. T, Th, S, 11.10.

...advanced topics of differential and integral calculus, with their ...ions, including differential equations. *After Mathematics* 21, 23,

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Mathematics 50, *Higher Algebra.* Mr. Mills.
T, Th, S, 9.10.
Topics of algebra which are useful for the further pursuit of applied mathematics, especially actuarial or statistical work. *Mathematics* 11 *or* 12.

Mathematics 52a, *Theory of Numbers.* Mr. Ore.
M, W, F, 10.10.
An introductory course on the theory of numbers with particular emphasis on the historical mathematical development. Numbers and methods of recording numbers by various peoples, the fundamental properties of numbers, primes, perfect and amicable numbers, the Algorism, solution of Diophantine problems, the theory of continued fractions with application to various special problems. *Mathematics* 21, 23, *or* 25.

Mathematics 54b, *Probability.* Mr. Ore.
M, W, F, 10.10.
The basic laws of probability, applications to problems of various kinds, the law of large numbers, normal and other probability laws. *After Mathematics* 21, 23 *or* 25.

Mathematics 56b, *Determinants and Matrices.* Mr. Jacobson.
T, Th, S, 11.10.
Basic properties of determinants and linear equations, the elements of linear vector spaces and characteristic values. *After Mathematics* 21, 23, *or* 25.

Mathematics 58a, *An Introduction to Modern Algebra.* Mr. Jacobson.
T, Th, S, 11.10.
A survey of the basic properties of certain algebraic systems: integral domains, fields, and groups. A development of number systems to and including the field of complex numbers.

Mathematics 64a, *Topology.* Mr. Bernard.
M, W, F, 11.10.
This course is to include a discussion of the fundamental topological properties of Euclidean space as well as an introduction to the postulational approach to abstract spaces. There will also be an introduction to combinatorial topology, with particular reference to two-dimensional surfaces.

Mathematics 66b, *Differential Geometry.* Mr. Hedlund.
M, W, F, 11.10.
Applications of calculus to the study of the geometry of curves and surfaces in three-dimensional Euclidean space; intrinsic differential metric properties of manifolds and connections with non-Euclidean geometries and topology.

OMITTED COURSES

Mathematics 30, *Advanced Calculus; Mathematics* 32, *An Introduction to Function Theory; Mathematics* 44a, *Calculus of Finite Differences; Mathematics* 60a, *Synthetic Projective Geometry; Mathematics* 62, *Analytic Geometry.*

MECHANICAL ENGINEERING

See also under B.E. programs, pages 41–43.

Mechanical Engineering. Mr. Bair, Mr. Keator, Mr. Phelps. 8 (27)
1. *Rec.,* T, Th, S, 8; *Comp.,* M, 1.45–3.35.
2. *Rec.,* T, Th, S, 9.10; *Comp.,* W, 1.45–3.35.
3. *Rec.,* T, Th, S, 11.10; *Comp.,* F, 1.45–3.35.
Survey of several fields of mechanical engineering with emphasis on applications of the fundamental sciences. *For students majoring in fields other than mechanical engineering.*

Mechanical Technology. Mr. Keator. 3 hrs. (8)
Rec., T, Th, 9.10.
Lab., 1. M, 1.45–4.35.
2. T, 1.45–4.35.
3. W, 1.45–4.35.
Study of equipment and processes for power generation and manufacturing. Consists of lectures, laboratory work, and visits to industrial plants. *For Sophomores in mechanical engineering only.*

Kinematics. Mr. Crossley. 3 hrs. (27)
1. *Rec.,* T, Th, 9.10; *Comp.,* T, 1.45–4.35.
2. *Rec.,* T, Th, 10.10; *Comp.,* W, 1.45–4.35.
3. *Rec.,* T, Th, 11.10; *Comp.,* Th, 1.45–4.35.
Arrangements of kinematic chains. Graphical and analytical study of displacements and velocities in mechanisms, including use of instantaneous centers, vector analysis, and relative velocities; accelerations in mechanisms; design of cams; kinematics of belting, gear tooth action, and gearing.

Dynamics of Machines. Mr. Crossley. 3 hrs. (27)
1. *Rec.,* T, Th, 9.10; *Comp.,* M, 1.45–4.35.
2. *Rec.,* T, Th, 10.10; *Comp.,* W, 1.45–4.35.
Application of dynamics to machines with an introduction to vibration. This may include rotor balancing, engine balancing, critical speeds, the theory and applications, inertia effects and dynamic stress in machine members, and governor theory. *After E.M.* 23b *and Mathematics* 21. *For students in mechanical engineering.*

Thermodynamics. Mr. ——. 4 hrs. (9)
Rec., T, Th, S, 10.10; *Comp. or Lab.,* T, 1.45–3.35.

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1954-55

Yale G

TYPICAL PROGRAMS FOR THE B.A. DEGREE

Major	*Freshman year*	*Sophomore year*	*Junior year*	*Senior year*
STANDARD DEPARTMENTAL MAJOR	English* Modern Language* Formal Thinking* Laboratory Science* Elective	Distribution† Distribution† Distribution† Distribution† Elective	Major Major Elective Elective Elective	Major Major Major Elective
B.A. MAJOR FOR PREMEDICAL STUDENTS	Chemistry† Biology† Modern Language* English* Formal Thinking*‡	Chemistry Physics Distribution† Distribution† Distribution†	Chemistry Zoology Major Major Elective	Major Major Major Elective
INTENSIVE DEPARTMENTAL AND DIVISIONAL MAJORS	English† Modern Language* Formal Thinking* Laboratory Science* Elective	Distribution† Distribution† Distribution† Distribution† Elective	Major Major Seminar Elective Elective Elective	Major Major Major Essay Elective

*Basic requirements, see pp. 2–3; for possible exemptions from English, modern language, formal thinking, and science, see pp. 18–19. Each exemption will add one elective to the student's program. A student who begins a modern language in college will, in general, need to carry it for a second year to meet the requirement in this field.

†For distribution requirements, see pp. 3–4. The order in which these are to be met is not prescribed. Of the five listed only four must be fulfilled except that premedical students are required by medical school to complete both requirements in science.

‡Mathematics is highly recommended.

For information about electing air science and tactics, military science and tactics, or naval science, see pp. 168–173.

The charts above show how the distributional and major requirements for the B.A. may be taken care of. The order in which the B.A. requirements may be met is optional but no student will be promoted to the Junior class who has not completed all of the basic requirements and at least two of the distributional requirements.

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