

CATALOGUE

The following bulletins, all biennial except Parts V and IX and the Appendix, comprise the Catalogue of the University; bulletin number and date of issue are given in parentheses:

1. Part I: Fellowships, Scholarships, Tutorships and Assistantships, Loan Funds, Main University (No. 3403; January 15, 1934).
2. Part II: College of Pharmacy (No. 3408; February 22, 1934).
3. Part III: School of Business Administration (No. 3410; March 2, 1934).
4. Part IV: College of Engineering (No. 3412; March 22, 1934).
5. Part V: General Information, Main University (No. 3516; August 1935).
6. Part VI: College of Arts and Sciences and School of Education (No. 3517; May 1, 1935).
7. Part VII: Graduate School (No. 3519; May 15, 1935).
8. Part VIII: School of Law (No. 3429; August 1, 1934).
9. Part IX: Medical Branch (No. 3505; February 1, 1935).
10. Appendix to Parts I-VIII: Annual Register of Students, Main University (Directory of the Main University and of the Extramural Divisions, No. 3441, with student supplement completing the Long Session of 1934 and including the Summer Session of 1934).

GENERAL PURPOSE OF THE CATALOGUE

The Catalogue of the Main University is intended to give general information to record the work of the biennium about to close, and to make announcements for the ensuing biennium.

As to the courses to be offered in the following Long Sessions, the Catalogue contains only a preliminary announcement and is superseded by the *Announcement of Courses*, printed in September of each year.

The Catalogue contains the official regulations for the next two years; as to degree requirements, these regulations are not valid beyond the

THE UNIVERSITY OF TEXAS BULLETIN

No. 3517: May 1, 1935

CATALOGUE NUMBER

Part VI: College of Arts and Sciences and
School of Education

1933-1934 and 1934-1935

With Announcements for
1935-1936 and 1936-1937



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A student on final trial whose score cannot be determined because of postponed grades is dropped from the rolls of the University.

Final trial is for a definite period, during which the student, while still in attendance upon his classes, must show marked improvement in his studies in default of which his connection with the University terminates with the period.

Class attendance.—The University expects, and has a right to expect, that a student on special observation or final trial will attend classes with unflinching regularity, will be punctual in reports and other written work, and will make every effort to show marked improvement in his courses. A failing student unwilling to put forth every effort to keep up with his classes should be withdrawn from the University.

In case of illness or any other imperative reason for absence, a student should file a written explanation of each absence with the Dean to be entered upon his record card.

Return after failure.—A student scholastically dropped from the University by reason of failure in work may register again, if dropped during the Long Session, not earlier than the next Summer Session or the beginning of the next Long Session. A student scholastically dropped at the end of the second semester may register in the next term of the Summer Session but not in the next Long Session earlier than the second semester except as provided under the required minimum of work rule.

A student who has been on special observation or final trial or who has been forced to withdraw by reason of failure in work is permitted to re-register subsequently in good scholastic standing only if he has remained continuously out of school as long as four semesters of the Long Session.

The foregoing requirements and the rules governing special observation and final trial apply to all students, and the Dean is without discretion except in the case of mature students over 25 years of age.

DEGREES

In the College of Arts and Sciences six degrees are offered: Bachelor of Arts, Bachelor of Journalism, Bachelor of Science in Home Economics, Bachelor of Science in Geology, Bachelor of Science in Medicine, and Bachelor of Science in Nursing.

GENERAL REQUIREMENTS

No honorary degree will be conferred by The University of Texas.

No degree will be conferred except publicly and on Commencement Day in June or in August.

It is desired that all candidates attend the Commencement at which their degree is to be conferred. However, those not wishing to do so may secure exemption from attendance by giving the Registrar written notice at least ten days in advance and providing the address and postage for mailing the diploma.

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A candidate absent without having given such notice will not be graduated as scheduled but, in order to secure his degree, must apply in the regular way (see p. 30) at a later Commencement.

No degree will be conferred without a residence in the Main University of at least two Long Session semesters, or five Summer Session terms, or one Long Session semester and two Summer Session terms, or an equivalent, and the completion in residence of at least thirty semester hours of work in the College of Arts and Sciences counting toward the degree.

At least twenty-four of the last thirty semester hours offered for an undergraduate degree must be taken in the Main University, but not necessarily in residence. In the case of the Degree Preparatory to Law, the degree of Bachelor of Science in Medicine, the degree of Bachelor of Science in Nursing, and Scheme II of Degrees Preparatory to Medicine, this rule applies to the academic work only.

Of the courses offered for any undergraduate degree, at least six semester hours in advanced courses in the major subject must be completed in residence in the Main University.

No more than half of the semester hours required for any degree offered in the College of Arts and Sciences may be done by correspondence.

A second bachelor's degree will be conferred until the candidate has completed at least twenty-four semester hours in addition to those counted toward the first bachelor's degree.

A candidate for a degree must register in the University and apply to his dean for his degree not later than May 1 if it is to be conferred in June, or later than August 1 if it is to be conferred in August.

Students will not be approved for graduation unless they have complied with the regulations regarding physical training. See the General Information Bulletin.

GRADUATION UNDER A PARTICULAR CATALOGUE

A student registering either for the first time or in a later year in the College of Arts and Sciences may obtain a degree in the College of Arts and Sciences according to the requirements of the catalogue then in force.

A student registering in the College of Arts and Sciences in the Summer Session may obtain a degree in this College according to the requirements of the catalogue applying to the previous Long Session or of the one in the next Long Session.

A student completing in the Division of Extension, either in extension class or by correspondence or in both ways together, by February 15 of any year at least twelve semester hours of work counting toward a degree in the College of Arts and Sciences may obtain that degree in accordance with the requirements of the catalogue applying to that year.

All of the above provisions, however, are subject to the restriction that all requirements for a degree in the College of Arts and Sciences must be completed within six years of the date of the catalogue chosen.

A student may always graduate under the current catalogue.

APPLYING FOR A DEGREE

A candidate for a degree must register in the University and should apply for the degree at the time of registration. Application must be made not later than May 1 for the Long Session, or August 1 for the Summer Session. To apply for a degree, the applicant

(a) Must file with the Dean a "Degree Card." This card will be filled out in the Registrar's office upon request of the applicant, and should be applied for as early as March 1 of the junior year previous to graduation in June or August. Attention to this matter will save the student trouble and delay in registration.

(b) Must register in the University with the Dean and must not withdraw before graduation.

(c) Must fill out a "Diploma Card" at registration and get the Dean to sign it.

In advising and in registering students, the Dean and his assistants try to prevent errors. Avoidance of errors is the main purpose of the Degree Card. But the student himself is expected to remember that graduation is attained according to some one catalogue, and is expected to study the requirements set forth in that one catalogue and to register in accordance therewith; and he finally registers entirely at his own risk.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS

PLAN I

A. Prescribed Work

1. Twelve semester hours in English (English 1, and 12 or 13).
2. Six semester hours in mathematics or six semester hours in Latin (Latin 1) or six semester hours in Greek (Greek 1 if no units in Greek were credited toward admission; Greek 12 if two units were so credited). A student who offers a course in one of the classical languages in satisfaction of this requirement may not offer the same course toward the satisfaction of Requirement 3.
3. Twelve semester hours of numbered courses in one foreign language either ancient or modern. In satisfying this requirement Latin B counts as a numbered course.
4. Twelve semester hours in the natural sciences, six being Chemistry 1 or 5 or Physics 1, 2, or 9, and six being Botany 1, or Geology 1, or Zoology 1 or 6. Any one may be taken first.
5. Three semester hours in American Government (Government 114). Three semester hours in economics; recommended, but not compulsory, for women.
6. Three semester hours in philosophy or psychology.
7. The courses set down in one of the groups below under C.
8. Thirty semester hours of advanced courses. Courses of senior rank count as twice their value in satisfying this requirement, but not more than six semester hours of senior courses may be counted in this manner. (See Rank

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and "Credit Value" of courses in the General Information bulletin.) Not more than twelve of the thirty semester hours of advanced courses of this requirement may be taken outside of the College of Arts and Sciences. At least ten semester hours in advanced courses in the major subject must be completed in residence at the Main University.

9. Enough other courses to make 120 semester hours, chosen by the student subject to the rules set forth in D below.

B. Special Requirements

1. The student must make an average of at least fifteen points per semester hour on the courses taken at the University which are required and counted toward the degree, an A grade on a semester hour counting as 21 points; a B as 18 points; a C as 15 points; a D as 12 points; an E, an F, or a G as zero.

A student whose average is at least twenty points per semester hour with an A on the major examination is graduated "with highest honors"; a student whose average is at least nineteen points per semester hour with an A on the major examination is graduated "with high honors"; a student whose average is at least eighteen points per semester hour with at least a B on the major examination is graduated "with honors."

In the case of students majoring in departments that do not require a major examination, honors are determined as in the preceding paragraph except that for the grade in the major examination there is substituted a grade, noted by the major department, for the student's work considered as a whole.

2. A student majoring in a department which requires a major examination must pass a general four-hour written examination in his major subject on May 7 of the second semester of his senior year, or on May 7 or August 10 following the completion of the requirement in the major subject. Not later than ten days before the date set for the examination the Dean sends to the chairmen of the several departments a list of students eligible for the examination. The chairman of the department in which the major is taken fixes the place of the examination and supervises the giving of it. August candidates may take this examination in May or on August 10. Students taking the examination will not be counted as absent from classes while actually taking it. In the modern foreign language group the examination may be partly oral to test the candidate's command of the spoken language. In setting the examination the faculty of the department will take into account the particular courses elected by the student, but will expect a more mature and comprehensive knowledge than is required in the regular semester examinations.

A student who fails to pass the major examination may take the examination the following May or August, but in no case will a special examination be given.

3. The student must, before May 15 of his senior year if a June candidate, or August 5 if an August candidate, show such ability to write clear and correct English as to satisfy the Committee on Students' Use of English. To promote the habitual use of clear and correct English, the written work

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(theses, reports, quizzes, examination papers, etc.) of every student in all his courses is subject to inspection by the Committee. It is the duty of each member of the teaching staff to require that his students shall be careful in their use of English, to give due weight in making up of grades to the students' use of English, and to report promptly to the Committee, submitting the evidence, any student whose use of English is seriously defective. If a student be found deficient, the Committee will prescribe for him such work as in its judgment is proper, and this work must be done to the satisfaction of the Committee before the student can obtain his degree.

4. The student must show such ability to read one foreign language as to satisfy the Committee on Foreign Language Requirements. This requirement may be met by the student at the end of his sophomore year or later. Application to appear before the Committee for examination should be filed with the Registrar in accordance with the dates announced in the official calendar.

It is the intent of this requirement that the student should have such control of the language chosen by him that he can understand and translate prose of moderate difficulty—preferably, in the case of the modern languages, in the field of his major subject.

C. Degree Groups

The courses laid down in one of these six groups must be included in the 120 semester hours required for the B.A. degree.

The student is advised to choose his group as early as possible in his college career but is not required to do so until the beginning of his junior year.

All students intending to major in any subject are strongly advised to consult with the chairman of their major department well in advance of the registration for an advanced course.

The student will note that it is possible so to arrange his minors and electives as to take in effect two majors, belonging either to the same or to different groups. Such an arrangement is especially desirable for those who wish to teach two subjects.

Courses in education, law, engineering, and business administration do not count either as majors or minors, except that business administration may be used as a minor when either economics or government is a major.

A course taken to meet the requirements under "A. Prescribed Year Counts" also toward satisfying the requirements laid down in that subject in these groups.

At least six semester hours of advanced courses in the major subject must be completed in residence at the Main University.

1. Classical (Greek or Latin) Group

Major Subject: Twenty-four semester hours in Greek or twenty-four semester hours in Latin. In either case at least twelve semester hours must be in advanced courses.

Minor Subject: Either (a) twelve semester hours of numbered courses in a second foreign language, preferably Greek if the major subject be Latin

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and in the major subject be Greek; or (b) twelve semester hours of advanced courses in English.

Not more than sixty-six semester hours may be counted in foreign language.

2. English Group

Major Subject: Eighteen semester hours of advanced courses in English, six semester hours of which must be in senior work.

Minor Subject: Twelve semester hours of numbered courses in Latin or German or Greek or French or Italian.

Six semester hours in history.

Not more than six additional semester hours of numbered courses in foreign language (ancient or modern); or eighteen semester hours in social science (besides the required history); or twelve semester hours in social science (besides the required history) and six semester hours in journalism or in public speaking.

3. Pure and Applied Mathematics Group

Major Subject: Thirty semester hours in mathematics, of which at least six must be in advanced courses.

Minor Subject: Eighteen semester hours in a second subject, preferably physics or philosophy or chemistry or economics.

Not more than six semester hours in philosophy.

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4. Modern Foreign Languages Group

Major Subject: Twenty-four semester hours of numbered courses in French or German or Spanish or Czech.

Minor Subjects: Twelve semester hours of numbered courses in a second foreign language (either ancient or modern), and either (a) six semester hours of advanced courses in this second foreign language, or (b) six semester hours of numbered courses in a third foreign language, or (c) six semester hours of advanced courses in English, or (d) six semester hours of advanced courses in social science.

Six semester hours in history.

Not more than sixty-six semester hours may be counted in foreign language.

5. Natural Science (Botany and Bacteriology, Chemistry, Geology, Physics, and Zoology) Group

Major Subject: Twenty-four semester hours in one natural science.

If the major subject be chemistry, there must be included at least six semester hours in general chemistry, six in quantitative analysis, six in organic chemistry, and four in physical chemistry, and at least twelve of the twenty-four semester hours must be advanced.)

Minor Subjects: Twelve semester hours in a second natural science, unless the major subject be physics, in which case there must be twelve semester hours in mathematics and six semester hours in chemistry; or unless the major subject be chemistry, in which case there must be either twelve semester hours

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[19. *Extempore Speaking*.—Theory and methods. Training in thinking and speaking before an audience. Class exercises in speaking extemporaneously on assigned topics. The organization of original materials; composition for public speaking and adaptation of speaking manner to subject matter. Prerequisite: Sophomore standing. MWF 9. Mr. GRISCOM. (Given as 319 and 319K after 1934-1935.)]

319f. *Extempore Speaking*.—Theory and methods. Training in thinking and speaking before an audience. Class exercises in speaking extemporaneously on assigned topics. The organization of original material; composition for public speaking and adaptation of speaking manner to subject matter. Prerequisite: Sophomore standing. Section 1, MWF 9; Section 2, TTS 9; Section 4, TTS 10. Mr. GRISCOM (1935-1936), Mr. ROUSSE. (Formerly first half of Public Speaking 19.)

319s. *Extempore Speaking*.—Repetition of Public Speaking 319f. TTS 10. Mr. ROUSSE.

319Ks. *Extempore Speaking*.—Theory and methods. Training in thinking and speaking before an audience. A continuation of Public Speaking 319. Prerequisite: Public Speaking 319. Section 1, MWF 9; Section 2, TTS 9. Mr. GRISCOM. (Formerly last half of Public Speaking 19.)

For Undergraduates and Graduates

320f. *Advanced Argumentation and Debate*.—Argumentation and debating in high schools and colleges. Analysis of current debate question. Coaching debate, extempore speaking, and declamations. Prerequisite: Six semester hours of sophomore courses in public speaking and junior standing. TTS 10. Mr. ROUSSE. (Formerly Public Speaking 316.)

321s. *Speech Problems*.—Speech training in secondary schools. Emphasis upon the teaching of public speaking in high school and college. Organization and direction of school literary and public speaking societies, with study of and practice in parliamentary procedure. Prerequisite: Six semester hours of sophomore courses in public speaking and junior standing. TTS 10. Mr. ROUSSE. (Formerly Public Speaking 315.)

25. *Seminar in Public Speaking*.—Special study of subjects for the University intercollegiate public speaking and essay contests. Class exercises in the discussion of assigned topics in the field of the subject studied. Prerequisite: Six semester hours of sophomore courses in public speaking. Mr. GRISCOM. (Alternates with Public Speaking 27; given in 1935-1936.)

27. *Advanced Public Speaking*.—For advanced students interested in professional work. Preparation and delivery of addresses for special occasions, including critical analysis of masterpieces such as great debates and platform addresses. Prerequisite: Six semester hours of sophomore courses in public speaking; junior standing. Hours to be arranged. Mr. GRISCOM. (Alternates with Public Speaking 25; omitted in 1935-1936.)

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328f. *Oratory*.—For students interested in intersociety and intercollegiate oratorical contests. Rhetoric of persuasive speech; oratorical masterpieces; practice in writing and delivery of various types of public addresses. Prerequisite: Twelve semester hours in public speaking. TTS 9. Mr. GRISCOM.

329s. *History of American Oratory*.—A study of the significant speeches and speakers in American history; examination of the historical, social, and political background of these speeches. Special attention is given to a few great orators as interpreters of their times. Oral and written reports required. Prerequisite: Public Speaking 328. TTS 9. Mr. GRISCOM.

DEPARTMENT OF PURE MATHEMATICS

ASSOCIATE PROFESSOR BATCHELDER, Chairman

PROFESSORS M. B. PORTER,⁷⁰ MOORE, DODD, ETLINGER; ASSOCIATE PROFESSORS VANDIVER,⁷¹ BATCHELDER; ADJUNCT PROFESSORS DECHERD, G. H. PORTER, LUBBEN; INSTRUCTORS BASYE, GREENWOOD,⁷² JONES, KLIPPLE, VICKERY

The requirement of six semester hours in mathematics for a degree in the College of Arts and Sciences may be satisfied by any two of the following courses: Pure Mathematics 301, 302, 303, and 304.

Students without credit for trigonometry are required to take Pure Mathematics 301. This may also be taken by students with more than fifteen credits, including trigonometry (however, note the following paragraph). But students with only fifteen credits, including trigonometry, are required to take Pure Mathematics 302. Pure Mathematics 302 may, indeed, be taken by all students with credit for trigonometry; and it is recommended for all such students who are interested in mathematics or its applications.

Solid geometry and trigonometry, either or both, accepted as entrance credit may each be counted as two semester hours toward a degree, provided (1) the subjects are in excess of full admission, and (2) an average grade of at least C is made in six semester hours of higher mathematics in the University.

The Department of Pure Mathematics will not recommend for high-school positions in mathematics persons who have credit for less than eighteen semester hours in the subject.

Students who plan to major in mathematics have a choice of several lines of progress, corresponding to the different subdivisions of the subject. In addition to Pure Mathematics 13 (calculus), which should be included in every group of courses, the student interested in analysis may take Pure Mathematics 21, 23, 83K, 84, 85, 86, 92, 93, or 96; in algebra and number theory, 315, 323, 337, 380, 381, 82, 82K, or 91; in foundations of mathematics and point-set theory, 323, 88, 89, or 90; in geometry, 327, 328, or 30; in probability, 45, 47, or 83K.

⁷⁰Absent on leave for the first semester of 1934-1935.

⁷¹Absent on leave for the session of 1933-1934.

⁷²Appointment for 1934-1935 only.

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Students who plan to major in physics or chemistry may take Pure Mathematics 13, 22, 41, 92, 93, 94, 95, or 96; in business administration or social sciences, 18, 45, 46, or 47.

Students planning to teach may take Pure Mathematics 327 or 333 or Education 27.

For Undergraduates

301-302. *Plane Trigonometry and Analytic Geometry.*—Pure Mathematics 301 and Applied Mathematics 304 may not both be counted for credit by the same student; nor may Pure Mathematics 302 and Applied Mathematics 305 both be counted for credit by the same student.

301s. *Plane Trigonometry.*—Pure Mathematics 301 and Applied Mathematics 304 may not both be counted for credit by the same student.

302f. *Analytic Geometry.*—For students who want only one semester of analytic geometry. Prerequisite: Pure Mathematics 301. Pure Mathematics 302 and Applied Mathematics 305 may not both be counted for credit by the same student.

302-303. *Analytic Geometry.*—Prerequisite: Trigonometry. Pure Mathematics 302 and Applied Mathematics 305 may not both be counted for credit by the same student.

304f. *College Algebra.*—(Not given in 1933-1934.)

304s. *College Algebra.*—(Not given in 1933-1934.)

13. *Calculus.*—Recommended to students intending to continue mathematics and to students of physics and chemistry. Prerequisite: Pure Mathematics 302. If before taking Pure Mathematics 13 the student has credit for nine or twelve semester hours in mathematics, Pure Mathematics 13 will count as three or six advanced semester hours. Pure Mathematics 13 and Applied Mathematics 13 may not both be counted for credit by the same student. Section 1, MWF 11; Section 2, TTS 11.

315s. *Theory of Equations.*—Determinants, symmetric functions, theory of polynomials, etc. Recommended as a fundamental course for students specializing in mathematics. Prerequisite: Pure Mathematics 302. MWF 10. Mr. VANDIVER (1934-1935), Mr. BATCHELDER (1933-1934). (Not given in 1935-1936.)

18. *The Mathematics of Finance.*—Compound interest, annuities, amortization, sinking funds, depreciation, valuation of bonds, mortality tables, insurance, and pensions. Prerequisite: Six semester hours in mathematics. TTS 9. Mr. DODD. (May be counted as a course in business administration if taken after junior standing is attained.)

For Undergraduates and Graduates

21. *Advanced Calculus.*—Rigorous treatment of the foundations of calculus. The convergence of infinite series, improper integrals, differential equations,

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and other topics. Prerequisite: Pure Mathematics 13. If before taking Pure Mathematics 21 a student has credit for three or six semester hours of advanced courses in mathematics, this course will count as a senior course to the extent of three or six semester hours. TTS 11. Mr. MOORE (1933-1934 and 1935-1936), Mr. KLIPPLE (1934-1935).

22. *Differential Equations and Applications.*—Solutions of differential equations of physics, chemistry, and engineering, and study of the properties of the solutions. Prerequisite: Pure Mathematics 13. Counts in the same manner as Pure Mathematics 21. The same as Applied Mathematics 22. MWF 8. Mr. ETLINGER.

323f. *Introduction to the Foundations of Algebra.*—Study of the axioms on which algebra is based. Prerequisite: Twelve semester hours in mathematics. Counts in the same manner as Pure Mathematics 21. Mr. VANDIVER. (Not given in 1933-1934, 1934-1935 or 1935-1936.)

327f. *Ruler and Compass Constructions.*—Critical study of the constructions of plane geometry, with numerous applications. Prerequisite: Twelve semester hours in mathematics. Counts in the same manner as Pure Mathematics 21. Mr. ETLINGER. (Not given in 1935-1936.)

328s. *Descriptive Geometry.*—The mathematical basis of descriptive geometry, treated by the Mongean method. Prerequisite: Twelve semester hours in mathematics. Counts in the same manner as Pure Mathematics 21. Mr. ETLINGER. (Given for the first time in 1934-1935; not given in 1935-1936.)

30. *Introduction to Modern Analytic Geometry.*—Space transformations and invariants. The methods will be largely analytic. Prerequisite: Pure Mathematics 303 and 13, the latter of which may be taken in parallel. Counts in the same manner as Pure Mathematics 21. MWF 10. Mr. PORTER, Mrs. PORTER (1934-1935). (Not given in 1933-1934 or 1935-1936.)

333s. *Teaching Problems in Mathematics.*—A survey and investigation of the teaching problems of elementary and junior college mathematics. Prerequisite: Twelve semester hours in mathematics. Counts in the same manner as Pure Mathematics 21. WF 4-5:30. Mr. PORTER.

336f. *Elementary Number Theory.*—Divisibility, linear congruences, quadratic residues, quadratic forms. Prerequisite: Eighteen semester hours in mathematics. Counts in the same manner as Pure Mathematics 21. Mr. VANDIVER (1935-1936), Mr. BATCHELDER (1933-1934). (Not given in 1934-1935 or 1936-1937.)

337s. *Topics in Modern Algebra.*—Invariants and the abstract theory of matrices with applications to analytical projective geometry. Prerequisite: Pure Mathematics 336 or eighteen semester hours in mathematics. Counts in the same manner as Pure Mathematics 21. Mr. ETLINGER (1933-1934), Mr. VANDIVER (1935-1936). (Not given in 1934-1935 or 1936-1937.)

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[41. *Analytical Mechanics*.—Equilibrium and motion of a particle and body in two or three dimensions. Prerequisite: Pure Mathematics 13. Counts in the same manner as Pure Mathematics 21. The same as Applied Mathematics 41. Mr. ETTLINGER. (Not given in 1933-1934, 1935-1936, or 1936-1937.)]

[45. *Probability*.—Distributions of Laplace, Poisson, and Pearson. Significance tests. Kinetic theory of gases. Statistical mechanics. Prerequisite: Eighteen semester hours in mathematics, including Pure Mathematics 13. Counts in the same manner as Pure Mathematics 21. (May be counted as a course in business administration.) Mr. DODD. (Not given in 1933-1934, 1935-1936, or 1936-1937.)]

46. *Mathematical Statistics*.—An advanced course in statistics dealing with such topics as the consistency and association of classes, simple and multiple correlation, criteria for chance phenomena, curve fitting, periodogram analysis, calculus of observations, and mathematical groundwork of economics. Prerequisite: Eighteen semester hours in mathematics. Counts in the same manner as Pure Mathematics 21. Mr. DODD. (Not given in 1934-1935 or 1936-1937.)

47. *Actuarial Mathematics*.—Graduation of mortality tables, premiums for life insurance and annuities upon one or more lives, varying benefits, valuation. Prerequisite: Eighteen semester hours in mathematics, including Pure Mathematics 13. Counts in the same manner as Pure Mathematics 21. (May be counted as a course in business administration.) Mr. DODD. (Not given in 1933-1934, 1934-1935, or 1935-1936.)

For Graduates

Graduate standing is a prerequisite for all graduate courses except on permission of the instructor in charge.

380f. *Finite Groups*.—Substitution groups and the abstract theory of these groups with applications. Prerequisite: Six semester hours of advanced course in pure mathematics and consent of the instructor. A considerable degree of mathematical maturity will be required. Mr. VANDIVER. (Not given in 1933-1934, 1934-1935, or 1936-1937.)

381s. *Algebraic Solvability*.—Algebraic solution of algebraic equations. Discussion of the quintic. Theory of algebraic fields. Prerequisite: Pure Mathematics 380 and consent of the instructor. A considerable degree of mathematical maturity will be required. Mr. VANDIVER. (Not given in 1933-1934, 1934-1935, or 1936-1937.)

82. *Theory of Algebraic Numbers*.—Prerequisite: Consent of the instructor. A considerable degree of mathematical maturity will be required. Mr. VANDIVER. (Not given in 1934-1935 or 1935-1936.)

[82K. *Research in Algebraic Numbers*.—Prerequisite: Pure Mathematics 82 and consent of the instructor. Mr. VANDIVER. (Given for the first time in 1934-1935; not given in 1935-1936 or 1936-1937.)]

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81. *Theory of Functions of Real Variables*.—Prerequisite: Six semester hours of senior or graduate courses in mathematics and consent of the instructor. Mr. DODD. (Not given in 1933-1934 or 1935-1936.)

81K. *Analytic Probability*.—Foundations of probability from the standpoint of modern analysis. Prerequisite: Pure Mathematics 21 or 83, and consent of the instructor. Mr. DODD. (Not given in 1934-1935.)

81L. *Analytic Functions*.—Prerequisite: Pure Mathematics 21 and consent of the instructor. Mr. PORTER. (Not given in 1934-1935 or 1935-1936.)

81M. *Infinite Processes*.—Infinite series and products. Prerequisite: Pure Mathematics 21 or 83. Mr. DODD. (Not given in 1933-1934, 1934-1935, or 1936-1937.)

81N. *Introduction to Modern Analysis*.—Designed to give the student some idea of the scope and power of function-theoretic methods and some insight into the leading ideas of modern mathematics. Prerequisite: Pure Mathematics 21. Mr. PORTER. (Not given in 1933-1934, 1934-1935, or 1936-1937.)

81O. *Continuous Groups*.—Lie theory of continuous groups, infinitesimal transformations, criteria for invariance of certain ordinary and partial differential equations under infinitesimal transformation, differential invariants, and applications to polynomial invariants of binary forms. Prerequisite: Pure Mathematics 21 or 22 or Applied Mathematics 325 and 326. Mr. COOPER. (Not given in 1933-1934 or 1934-1935.)

81P. *Foundations of Mathematics*.—Critical study of the foundations of mathematics. Prerequisite: Consent of the instructor. A considerable degree of mathematical maturity will be required. Mr. MOORE. (Not given in 1933-1934.)

81Q. *Point-sets and Continuous Transformations*.—Critical study of point-sets, curves, regions, etc. Prerequisite: Consent of the instructor. Mr. MOORE. (Not given in 1933-1934 or 1934-1935.)

81R. *Research in Point-set Theory*.—Prerequisite: Consent of the instructor. Mr. MOORE.

81S. *Theory of Linear Associative Algebras*.—Prerequisite: Pure Mathematics 380 and consent of the instructor. Mr. VANDIVER. (Not given in 1933-1934, 1935-1936, or 1936-1937.)]

81T. *Partial Differential Equations*.—Recommended for advanced students in physics and engineering. Prerequisite: Pure Mathematics 22 or its equivalent. The same as Applied Mathematics 92. Mr. ETTLINGER. (Not given in 1933-1934, 1934-1935, or 1936-1937.)

81U. *Selected Topics in Mathematical Physics*.—Prerequisite: Six semester hours of senior courses in mathematics or physics and graduate standing. Mr. ETTLINGER. (Not given in 1934-1935 or 1935-1936.)

81V. *Theory of Relativity*.—Study of the theory of space and time developed by Einstein and others, with applications to dynamics and other branches of