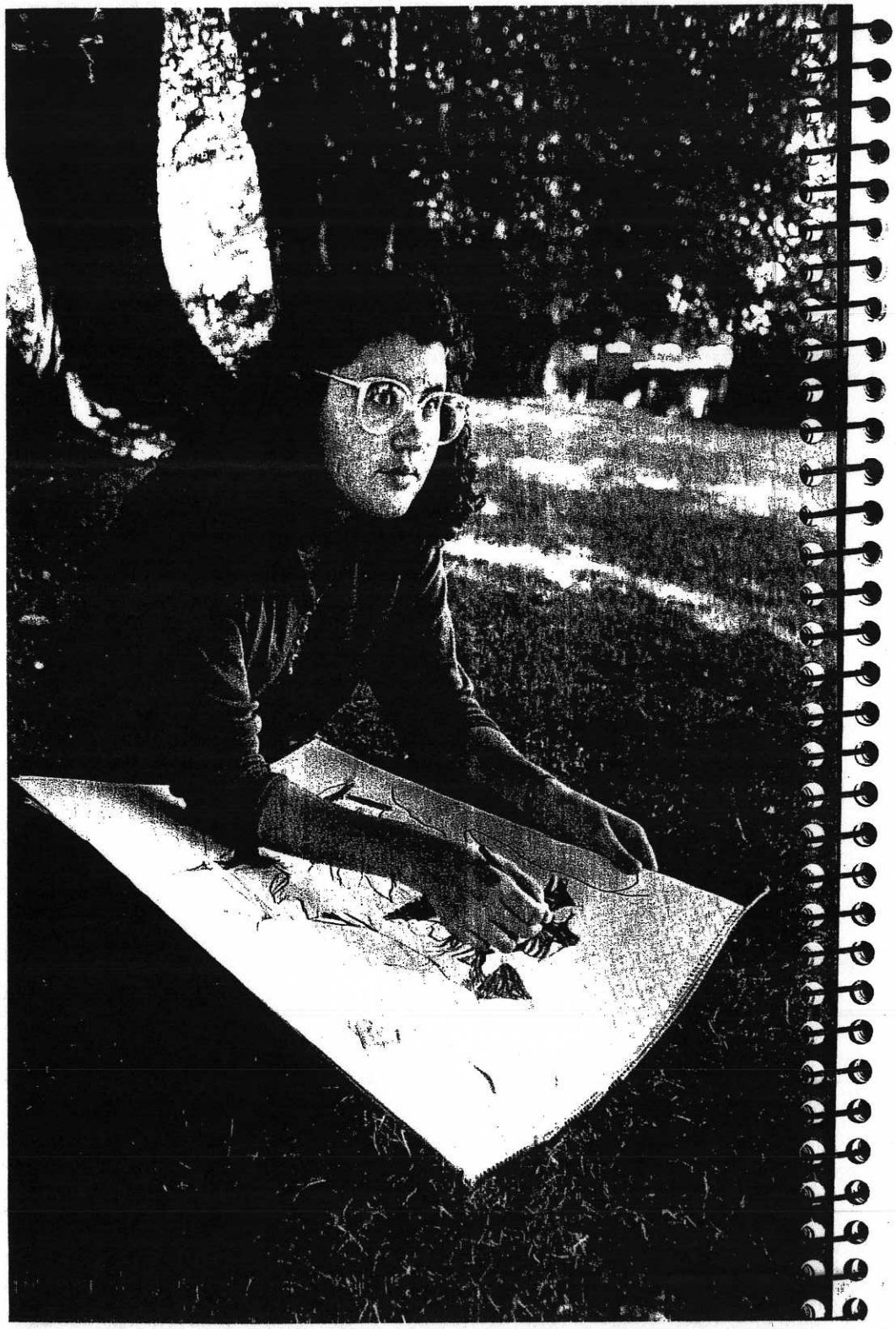

1995-1996

Reed College

Progression to the Bachelor of Arts Degree

The general curricular path at Reed is designed to insure that the student is exposed to a broad range of subject areas. Distribution requirements that include the arts, social sciences, mathematics, foreign languages, and natural sciences expose the student to many different methods of intellectual inquiry.

Typically, students begin to concentrate in one particular field by the close of their sophomore year. In declaring a major, students plan a program with the help of their faculty adviser that meets division, departmental, and College requirements.

While the needs and interests of each student help determine the individual programs of study, there are several requirements that are the cornerstones of a Reed education. (See *Degree Requirements*.)

1. Every student takes a one-year course in Humanities.
2. All seniors engage in a one-year research project, and prepare and defend a thesis based on that research.
3. In order to receive the Bachelor of Arts degree, Reed students must complete a certain number of course units in a variety of subjects. For more specific information on course and distribution requirements, see the entire section of the catalog titled *Academic Practices*.
4. Each department has its own set of requirements for students majoring in that field.
5. *Additional Division requirements* exist in three of the five academic divisions (The Division of Mathematics and Natural Sciences and the Division of Philosophy, Education, Religion, and Psychology have only departmental requirements).

Reed students have the opportunity to major in a wide variety of fields. They may select a major from one of the following:

Anthropology
Art
Biology
Chemistry
Chinese
Classics
Economics
English Literature
French Literature
General Literature
German Literature
History
Mathematics
Music
Philosophy
Physics
Political Science
Psychology
Religion
Russian Literature
Sociology
Spanish Literature
Theatre

In addition, interdisciplinary majors are available in:

American Studies
Chemistry-Physics
Classics-Religion
Dance-Theatre
History-Literature
International Studies
Linguistics
Literature-Philosophy
Literature-Theatre
Mathematics-Economics
Mathematics-Physics
Mathematics-Sociology
Medieval Studies
Philosophy-Mathematics
Philosophy-Religion

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To supplement these established interdisciplinary majors, special programs that link two or more disciplines may be approved. The student's advisers (one from each of the relevant departments) and the departments concerned must review and approve the proposed program.

Course numbers ending in 0 are year-long courses; those ending in 1, 3, 5, or 7 are taught in fall semester; those ending in 2, 4, 6, or 8 are taught in spring semester. Introductory courses that have no prerequisites are 100-level courses; 200-level courses are introductory courses that normally have some prerequisite; 300-level courses are intended for students with a background in the discipline; and 400-level courses are advanced courses with more than one prerequisite.

For the most part, courses considered basic to the discipline of a department are given every year. In addition, departments expand their offerings by including work in other areas on a two- or three-year cycle. Courses marked "not offered 199-" or "offered in alternate years" can be expected in the departmental schedules in the next year or two.

Degree Requirements

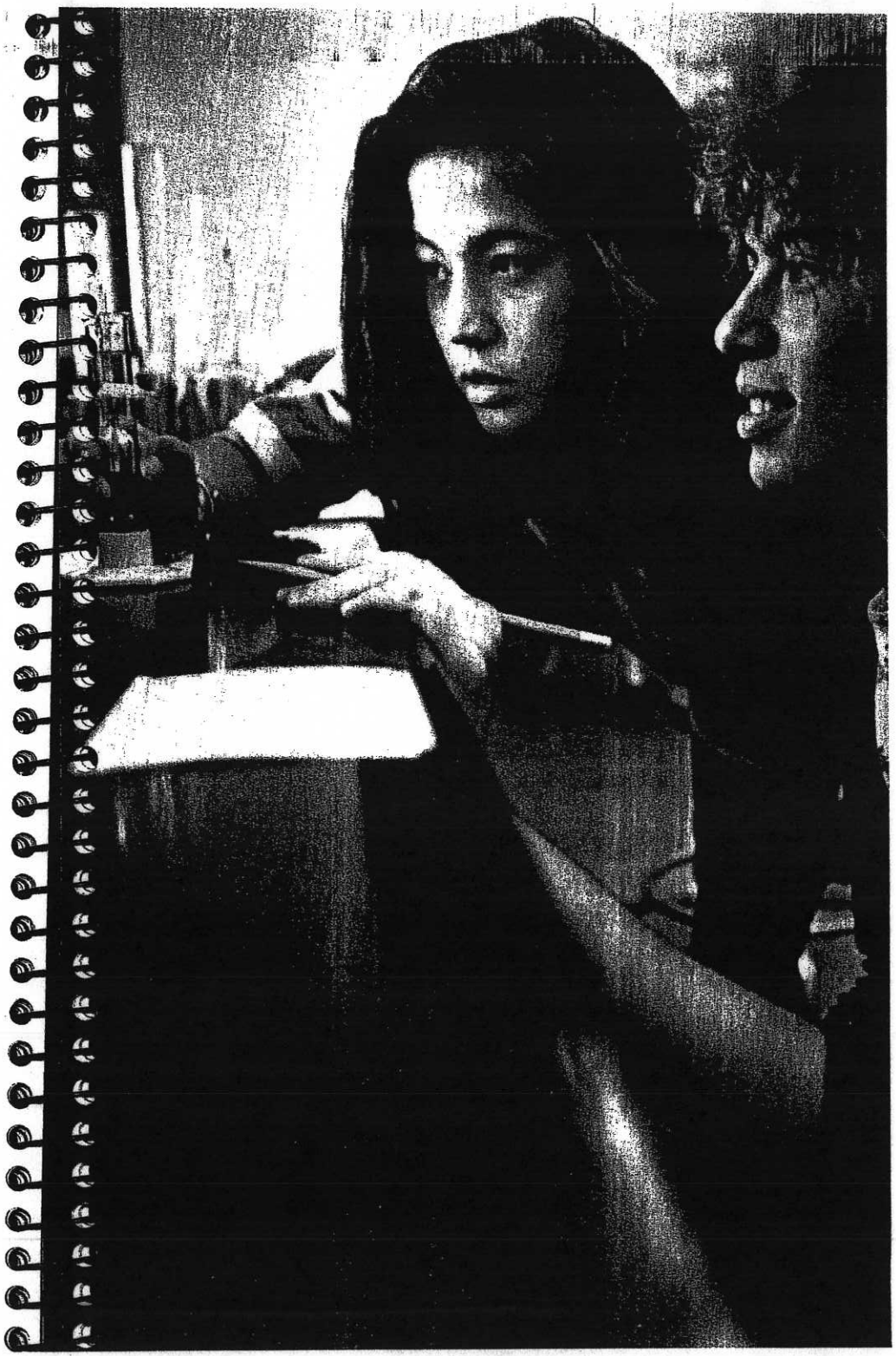
To be eligible to receive the Bachelor of Arts degree from Reed College, students must fulfill seven basic requirements: sufficient units of academic work; college distribution requirements; major departmental distribution requirements; divisional requirements (except for the Division of Mathematics and Natural Sciences and the Division of Philosophy, Education, Religion, and Psychology); Junior Qualifying Examination; senior thesis; and Senior Oral Examination. Descriptions of these requirements follow.

Credit Requirements

Academic credits at Reed are defined in "Units." A full course for one semester carries one Reed unit of credit: the equivalent of four semester-hours or six quarter-hours.

Minimum credit required for graduation following a four- or five-year program of study is 30 units of academic work plus six quarters of physical education. Students of exceptional preparation and ability may be recommended by the faculty for graduation at the end of three years and upon completion of 27 units of academic work plus six quarters of physical education. (For other specifics, see the paragraphs headed "Course Load.")

To be eligible for graduation, students must complete two full years of study at Reed (a minimum of 15 academic units), including the senior or degree year, which must consist of a minimum of six academic units. At least two of these units, one of which must be in a non-thesis course, must be carried in each of the two semesters. These six units, however arranged, constitute a full program for the senior year and require payment of full tuition each semester, even if the number of units being taken in one of the two semesters falls below three. The work of the degree year is to be done while attending Reed, except in special programs such as the 3-2 combined programs in business administration, computer science, engineering, forestry, medicine, veterinary medicine, and the Reed-Pacific Northwest College of Art Program. Such programs require three years of study at Reed and an additional two at the cooperating institution. (See "Special and Combined Programs.")



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College Distribution Requirements

The course distribution required of all Reed undergraduates is carefully designed and frequently re-evaluated to assure the broad understanding of the arts and sciences which a liberal education signifies. The requirements listed below were approved by the faculty during the 1980-81 academic year.

Humanities

Humanities 110 is required of all freshmen. It will also be required of transfer students who lack adequate background in this area. Students who transfer in with sophomore or junior standing may substitute Humanities 210 or 220 and one additional unit from Group A or Group B (below) for this requirement. If this substitution is made, Humanities 210 or 220 may not be used to meet either the Group A or Group B requirement.

Group A: Literature, Philosophy, and the Arts

Minimum of one full-year course or the equivalent in semester courses totaling two units in the same discipline, which may be selected from the following: courses in art history, classics (except 371, 373), English, literature (both foreign and in translation), music (except applied), philosophy, religion, theatre courses (excluding studio courses) or Humanities 210 or 220.

Group B: History, Social Sciences, and Psychology

Minimum of two units in the same department from one of the following: Anthropology 211/212 and one additional upper-division anthropology course; Political Science 211/212 and any other political science course; Economics 201/202 and one other Economics course; Sociology 210; or any two units in history or psychology, or Humanities 210 or Humanities 220. (Note: Humanities 210 or 220 may not be used for either Group A or Group B by history majors. Since Political Science 211 is the only political science course which surveys the entire discipline, it will not be waived.)

Group C: The Natural Sciences

Minimum of two units in the same department from one of the following: biology, chemistry, natural science, or physics.

Group D: Mathematics, Logic, or Foreign Language or Linguistics

Minimum of two units from either:

1. Mathematics and formal or symbolic logic.
2. Or from a foreign language or linguistics.

The following regulations apply to each and all of the foregoing Group requirements:

1. Each group calls for two units in the same discipline.
2. No course may satisfy more than one Group requirement; (i.e., Humanities 210/220 may be used for either Group A or Group B, but not for both.)
3. Courses in the major department may not be used to meet any of the Group requirements, except in the case of interdisciplinary majors, who may use work in one of the two departments making up the combined major to fulfill one Group requirement.
4. No group requirement may be satisfied by a waiver, by independent study courses, by Advanced Placement examinations, or by courses taken for credit/no credit.

Foreign Language

Proficiency in a foreign language as a requirement for graduation is a matter left to the discretion of the major departments or divisions. Some retain a language requirement, and most of those that do not require foreign language study do recommend that whenever possible such study should be included in the student's program. Check the departmental and divisional listings for specific information.

Physical Education

Satisfactory completion of three semesters of approved activities prior to graduating. Each semester is divided into two quarters; six quarters of approved activities must be completed to meet the physical education requirement. Only one credit of PE credit may be earned during any quarter.

Admission to a Major

Students may declare a major (or the intention to major) at any time, preferably no later than the end of the sophomore year. A student achieves junior standing and comes under the jurisdiction of one of the established divisions of the college or one of the established interdisciplinary committees after the completion of a minimum of 13 units of course work and the filing of an approved Declaration of Major form, indicating the completion of the required introductory work and outlining the remainder of the program to be taken in order to achieve graduation. (Students declaring an ad hoc interdisciplinary major must also file a statement giving the rationale for such a major. This statement will then be reviewed by the departments involved to determine the validity of the rationale of the proposed program.) The appropriate departments, divisions, and committees will review the records of all newly declared juniors and advise them whether the proposed program of study is satisfactory, or whether certain course changes are required. Specific course and credit distribution requirements for majors are detailed in the descriptions of the departmental and interdisciplinary programs.

Qualifying Examination

Students must pass a qualifying examination administered by the major division and/or department before being allowed to begin a thesis in the senior year. These examinations are given near the end of the junior year. The objectives of the qualifying examination are: (1) to gauge the student's mastery of his or her discipline and/or related disciplines; (2) to serve as a diagnostic aid in identifying weaknesses in the student's preparation for advanced study or thesis work in that discipline; (3) to assist the student in unifying his or her knowledge of a major field of study; and (4) to assist the major department or interdivisional committee in assessing the effectiveness of its own program. It is possible that a student who does not demonstrate competence in a field may be required to take further work. A second failure will debar the student from candidacy for a degree in that department, but the student may be encouraged to transfer to another department or division. The review may also identify those who appear to need more time to develop their capabilities for the sustained independent work of the senior thesis.

The qualifying examination is not meant to qualify only the best students and in actuality does not operate that way. The student's performance in the examination as well as in all previous course work is discussed in full departmental or divisional meetings to assess the student's readiness to begin work on a thesis.

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Senior Thesis and Oral Examination

The distinctive feature of a student's senior year is the sustained investigation of a carefully defined problem—experimental, critical, or creative—chosen from the major field and considered as one part of an overall senior-year program. The problem is selected and developed through the year by the student, with the support of the faculty adviser. At the conclusion of the year, the student submits to community scrutiny a thesis describing the problem and its attempted resolution.

The thesis involves substantially more than the writing of a long paper in a course; it requires the development of new knowledge and a wide variety of skills and permits the student to integrate all aspects of his or her academic experience.

The candidate for graduation takes a final comprehensive two-hour oral review under the direction of the major division or department. The oral examination may cover the work of the student's entire program, but emphasis is on the thesis and major field. The committee of examiners will include faculty from the student's own department and division, a second division, and, on occasion, professionals from outside the College.

Academic Practices

A code of academic policies, describing registration procedures, grades and evaluation, course load, and other practices and requirements, underlies the academic program at Reed. The policies are known as the Faculty Code, a copy of which is available to students in the library, and in several offices on the campus. Key policies are described here.

Registration

Students register their official program of studies for the full year at the beginning of the fall semester. The filing of this material obligates the student to the payment of tuition for the current semester. Students who fail to complete their registration by the close of the designated registration period will be charged a late registration fee of $50. A student may not register later than the third week of the semester. Exceptions to this charge may be made by the controller or registrar only if the reasons for the delay are judged to be sufficiently beyond the control of the student to warrant such a waiver.

At the beginning of the spring semester, students confirm the spring program for which they registered in the fall and confirm financial arrangements. Failure to do this within the time limit will result in a late registration fee. Any change in program which seems advisable may be made without penalty at this time.

Course Load

Reed College offers its courses either on a year basis, in which work will take two consecutive semesters to complete, or on a semester basis. In a year course, credit is not normally given for only one semester of work, although in special cases the instructor may authorize the granting of such credit.

Academic credits at Reed are defined in "Units." A full course for one semester carries one Reed unit of credit—the equivalent of four semester hours or six quarter hours.

Undergraduate work is reported in terms of course load. A full course is considered to be equivalent to approximately one-fourth of a student's load. For transcript purposes, a full course may be considered to have the value of four semester hours and is designated as one unit. A normal load for students is 3 1/2 to 4 1/2 academic units per semester (plus two quarters of physical education per semester for freshmen and sophomores). Students who register for less than 3 or more than 4 1/2 units in any semester must have such programs approved by the Administration Committee if they are freshmen or sophomores, or by the major division if they are juniors or seniors.

Class Attendance

Generally, no roll is taken in class, but the expectation is that, except for circumstances beyond the control of the student, all classes will be attended. Whether present or absent, students must complete the work of the course; professors use their own judgment as to the effect of absence on the student's record. A student who formally registers for a course, but who later decides not to continue with it, must withdraw from it by filing an official Change of Course petition to clear his or her record. Failure to do so may result in a grade of UW or F on the record.

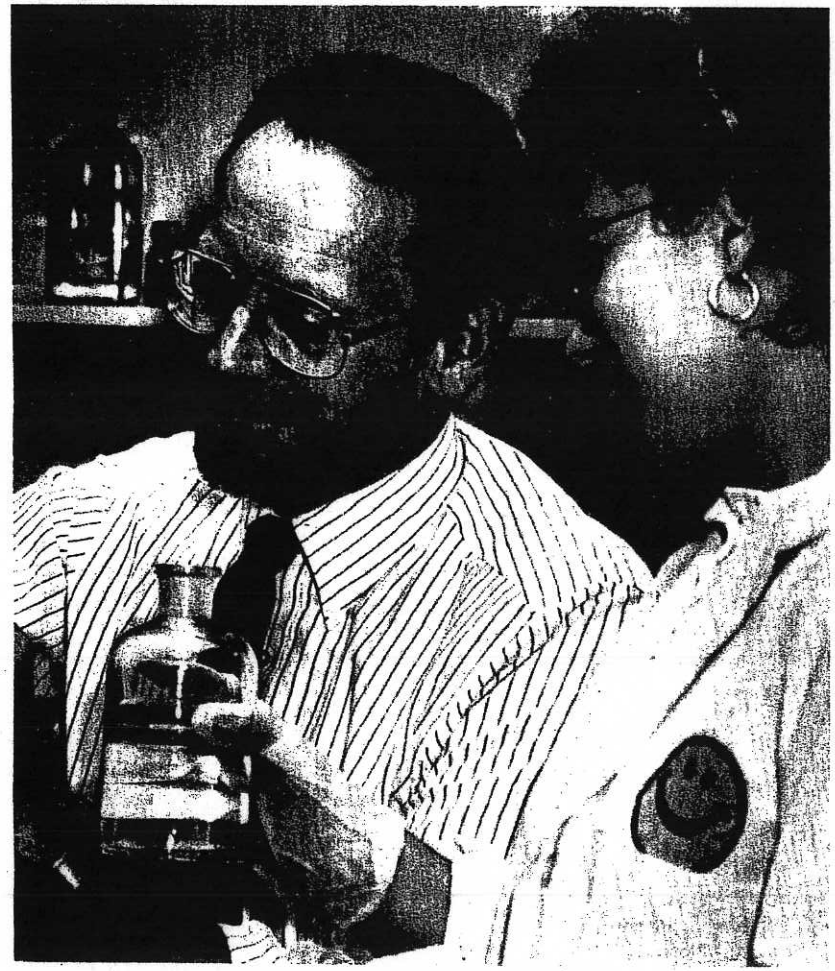
statement to the committee, normally before the end of the second semester of the junior year, including (1) an outline of the proposed course of study, including specific courses, (2) a list of past courses, and (3) a rationale designed to persuade the committee that the program makes sense in terms of coherent intellectual objectives, and that these objectives could not be attained through one of the other division programs.

In addition to the written Junior Qualifying Exam, there is an oral exam as well.

Course Requirements

Exclusive of work needed to meet general college requirements:

1. Standard divisional requirements in Literature and Languages.
2. Six to eight units of literature courses at the 300 or 400 level, of which four shall be within the student's area of special interest.
3. Thesis.



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Division of Mathematics and Natural Sciences

Introductory courses in the Division of Mathematics and Natural Sciences help students become familiar with elementary principles that form a basis for understanding each discipline. Instruction clarifies methods of observation, experimentation, analysis, and reasoning by which insight is gained into the nature of the mathematical and physical worlds. Introductory and advanced courses in mathematics and the natural sciences are planned as part of the students' education in the liberal arts. Advanced courses in different scientific fields extend students' knowledge and give them training in specialized techniques characteristic of the individual sciences.

An important part of a science student's experience at Reed is the thesis, an independent project of research or critical or creative work carried out under the guidance of a faculty member. For several years mathematics, biology, chemistry, and physics faculty have received grants which have increased equipment and resources available for senior thesis projects. Qualified seniors may gain valuable experience by assisting in work covered by grants.

By national standards, an unusually high percentage of graduates of the division continue their work in graduate school.

Divisional Requirements

The Division of Mathematics and Natural Sciences has no requirements of its own. A student in the division must fulfill all requirements for the department in which he or she majors, as well as general college requirements.

Mathematics

Joe P. Buhler
Algebra, number theory, and computational complexity.

Albyn Jones
Statistics.

John Leadley
Algebra and category theory.

Raymond A. Mayer
Analysis.

David Perkinson
Algebraic geometry.

V. Rao Potluri
Algebra.

Joe Roberts
Number theory and combinatorics.

Jerry Shurman
Number theory.

Thomas W. Wieting
Ergodic theory.

Mathematics courses present a program of general studies for the liberal arts student as well as for the student who plans to specialize in mathematics or in a field using mathematics.

Five courses are open to students who have had no previous college mathematics: Mathematics 110, 132, 200, 301, and 302. Math 132 is a one-semester course (offered in the spring semester) which is not a prerequisite for further work in mathematics, but which provides an introduction to some techniques useful in discrete problems. Courses numbered 110 and 200 are different beginning points for the calculus sequence.

The two sequences, Mathematics 110 and 210, and Mathematics 200 and 201, are regarded as interchangeable prerequisites for upper-division courses in mathematics and for courses in other departments in which calculus is used.

Mathematics 301 and 302 are courses for upper-division non-science students.

Course Requirements

Exclusive of work needed to meet general college requirements:

1. Mathematics 110 and 210, or 200 and 201.
2. Mathematics 321, 331/334, and 332.
3. Four additional units in mathematics courses (excluding Mathematics 470) numbered higher than 302.
4. One physics course.
5. Mathematics 470.

110 Analysis I: Alternative B

Full course for one year. An introduction to the concepts and techniques of discrete and continuous mathematics. The first part of the course will be devoted to the structure of the real number system and the limit concept. The second part is devoted to calculus of functions of one-variable, including derivatives, the definite integral and the fundamental theorem of calculus. Prerequisite: students should have completed two years of algebra and one year of plane geometry. Lecture-conference.

132 Finite Mathematics

Full course for one semester. This course will cover permutations, combinations, finite mathematical structures, inclusion-exclusion principle, elements of the theory of graphs, permutation groups and the rudiments of Polya theory. Prerequisite: three years of high school mathematics or permission of the instructor. Lecture-conference.

200 Analysis I: Alternative C

Full course for one year. This course and its sequel, Mathematics 201, are for freshmen who have had a one-year course in calculus. The first part of the course will be devoted to an introduction to the concepts and techniques of discrete and continuous mathematics. The second part of the course will include topics from one-variable calculus, as needed, and will begin the study of calculus of functions of several variables. Prerequisite: one year of calculus and Reed calculus placement examination. Lecture-conference.

201 Analysis II: Alternative C

Full course for one semester. Continuation of Mathematics 200. Prerequisite: Mathematics 200. Lecture-conference.

210 Analysis II: Alternative B

Full course for one year. A continuation of Mathematics 110, including Taylor's theorem, infinite series, ordinary differential equations, and an introduction to calculus of functions of several variables. Prerequisite: Mathematics 110. Lecture-conference.

271 Introduction to Statistics and Data Analysis I

Full course for one semester. This course, together with Math 272, constitutes an introduction to statistical modeling and data analysis. Both courses will make substantial use of statistical software for the analysis of data. Math 271 will cover basic techniques of data analysis, elementary probability theory underlying statistical methodology, and statistical inference: estimation and hypothesis testing. These concepts will be applied in an in-depth study of linear models, including regression

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and analysis of variance. Prerequisite: sophomore standing or consent of the instructor. Lecture conference. Cross-listed as Sociology 271.

272 Introduction to Statistics and Data Analysis II

Full course for one semester. Continuation of Math 271. Experimental design, categorical dat analysis, and selected topics in multivariate data analysis. Prerequisite: Mathematics 271 or consen of instructor. Lecture-conference. Cross-listed as Sociology 272.

301 and 302 General Mathematics I and II

Each is a full course for one semester. Each of these courses is designed to acquaint students witl the nature of mathematics as a discipline and as a science useful in examining the world. Though th students are not expected to have studied much mathematics, these courses will deal with matter requiring careful and precise reasoning; in the process, students will be expected to acquire a numbe of mathematical skills. Students should consult the instructors for more detailed information abou the courses. Since the topics covered in Mathematics 301 and 302 will vary from year to year, a student taking a second course in this group must consult the instructor to insure that the previou work will not be duplicated. Not open to freshmen. Lecture-conference. Not offered 1990-91.

311/314 Complex Analysis

Full course for one semester. A study of complex valued functions: Cauchy's Theorem anc residue theorem, Laurent series, and analytic continuation. Prerequisite: Mathematics 201 o Mathematics 210. Lecture-conference. Offered fall semester.

321 Advanced Calculus

Full course for one semester. A careful study of continuity and convergence in metric spaces Sequences and series of functions, uniform convergence, normed linear spaces. Prerequisite Mathematics 201 or 210. Mathematics 331 or 334 must be taken before or at the same time as this course. Lecture-conference.

322 Ordinary Differential Equations

Full course for one semester. An introduction to the theory of ordinary differential equations. Existence and uniqueness theorems; global behavior of solutions; stability theory; qualitative theory; numerical methods. Prerequisite: Mathematics 201 or 210 and Mathematics 331 or 334. Lecture-conference.

331/334 Linear Algebra

Full course for one semester. A brief introduction to field structures, followed by presentation of the algebraic theory of finite dimensional vector spaces. Geometry of inner product spaces is examined in the setting of real and complex fields. Mathematics 201 or 210 must be taken before or at the same time as this course. Lecture-conference. Offered both semesters.

332 Abstract Algebra

Full course for one semester. An elementary treatment of the algebraic structure of groups, rings fields, and/or algebras. This course may touch on a number of areas, but is primarily concerned with only one. Prerequisite: Math 331 or 334. Lecture-conference.

341/342 Geometry

Full course for one semester. Topics in geometry selected by the instructor. In recent years the course has dealt with the theory of plane ornaments, coordinatization of affine and projective planes and non-Euclidean geometry. Prerequisite: Mathematics 331 or 334 or permission of the instructor Lecture-conference. Offered in alternate years. Not offered 1990-91.

351/352 Mathematical Logic

Full course for one semester. The course will be concerned with one or more of the following areas of mathematics: recursive function theory, model theory, computability theory, general theory of formal systems. Prerequisite: two years of college mathematics. Lecture-conference. Offered in alternate years; not offered 1990-91. Cross-listed as Philosophy 451/452.

361/362 Numerical Analysis

Full course for one semester. Representation of numbers in a computer. Computer arithmetic propagation of errors. Linear and nonlinear equations. Numerical differentiation and integration The eigenvalue problem. A small amount of time will be spent discussing some high-level computer language. Students will be required to write computer programs. Prerequisites: Mathematics 201 or 210, and 331 or 334. Lecture-conference. Offered in alternate years; not offered 1990-91.

372 Combinatorics

Full course for one semester. Emphasis will be placed on enumerative combinatorics including such topics as the principle of inclusion-exclusion, formal power series and generating functions

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and permutation groups and Polya theory. Selected other topics such as Ramsey theory, inversion formulae, the theory of graphs, and the theory of designs will be treated as time permits. Prerequisite: Mathematics 201 or 210. Lecture-conference. Offered in alternate years; offered in 1990-91.

382 Algorithms and Data Structures

Full course for one semester. An introduction to computer science covering the design and analysis of algorithms. The course will focus on various abstract data types and associated algorithms. The course will include implementation of some of these ideas on a computer. Prerequisites: knowledge of programming and Math 210, or permission of the instructor. One-time offering only, 1990-91. Lecture-conference.

401/404 Probability

Full course for one semester. A development of probability theory in terms of random variables defined on discrete sample spaces. Special topics may include: Markov chains, Stochastic processes, measure-theoretic development of probability theory. Prerequisite: Mathematics 201 or 210. Lecture-conference. Offered fall semester. Cross-listed as Sociology 401/404.

402 Mathematical Statistics

Full course for one semester. Theories of statistical inference, including maximum likelihood estimation and Bayesian inference. Topics may be drawn from the following: large sample properties of estimates, linear models, multivariate analysis, empirical Bayes estimation, and statistical computing. Prerequisite: Mathematics 401/404 or consent of the instructor. Lecture-conference. Offered in alternate years; offered 1990-91. Cross-listed as Sociology 402.

411 Topics in Advanced Analysis I

Full course for one semester. Topics selected by the instructor. Prerequisite: Mathematics 321 or permission of instructor. Lecture-conference.

412 Topics in Advanced Analysis II

Full course for one semester. Topics selected by the instructor. Prerequisite: Mathematics 321 or permission of instructor. Lecture-conference. Offered in alternate years; not offered 1990-91.

421/422 Elementary Number Theory

Full course for one semester. A study of integers, including topics such as divisibility, theory of prime numbers, congruences, and solutions of equations in the integers. Prerequisite: junior or senior standing or permission of instructor. Lecture-conference. Offered in alternate years; offered 1990-91.

431 Algebraic Structures

Full course for one semester. Selected topics from the study of various algebraic structures and their applications. Prerequisite: Mathematics 331/334 and 332, or permission of instructor. Lecture-conference.

432 Topics in Algebra

Full course for one semester. Topics selected by the instructor, for example, associative algebra, Galois theory, algebraic geometry, and geometric algebra. Prerequisite: Mathematics 431 or permission of instructor. Lecture-conference. Offered in alternate years; offered 1990-91.

470 Thesis

One-half or full course for one year.

481/482 Special Topics

One-half course for one semester. Independent reading. Prerequisite: junior or senior standing and approval of instructor and division.

Biology

Stephen W. Arch
Regulatory biology; neurochemistry; neuropeptide biosynthesis.

Steven D. Black
Developmental biology.

Bert G. Brehm
Plant evolution and systematics; pollination biology.

David A. Dalton
Plant physiology; biological nitrogen fixation and oxygen toxicity. On leave fall 1990.

G. Frank Gwilliam
Neurobiology; invertebrate zoology; marine biology.

Robert H. Kaplan
Evolutionary ecology; population biology.

Lewis Kleinholz, *Emeritus*
Physiology and chemistry of neurosecretion.

Maryanne C. McClellan
Cellular biology; electron microscopy; hormonal regulation of growth and differentiation.

Laurens N. Ruben
The development and regulation of immune responses. On leave 1990-91.

Peter J. Russell
Molecular genetics; organization and expression of ribosomal DNA; molecular biology of development in *Candida albicans*. On leave 1990-91.

Janis Shampay
Molecular genetics; chromosome structure.

Helen A. Stafford, *Emeritus*
Plant physiology and regulation of phenolic metabolism.

The program offered by the biology department emphasizes the development o the student's capacity to use and create scientific information. The departmen provides a variety of opportunities for students to challenge their own abilities t create the intellectual framework and learn the techniques necessary for answerin the questions that interest them. The faculty, through active professional researc programs of their own, offer opportunities for student involvement in the "business' of biology. An active guest-scientist program adds to the unique research-orientec experience for the Reed biology undergraduate.

Reed students may broaden their research experience by arrangement wit faculty of the Oregon Health Sciences University, the Oregon Graduate Institute o Science and Technology, and the Oregon Regional Primate Research Center Additionally, faculty of the Neuro-sciences Institute of Good Samaritan Hospita and Medical Center hold adjunct appointments in the Reed biology department.

This atmosphere provides students with an unusual opportunity to develop a understanding of themselves as well as a firm background in the field, *regardles of what their goals might be*. Information on the subsequent history of biolog graduates shows that about 60 percent enter teaching and/or research in biology