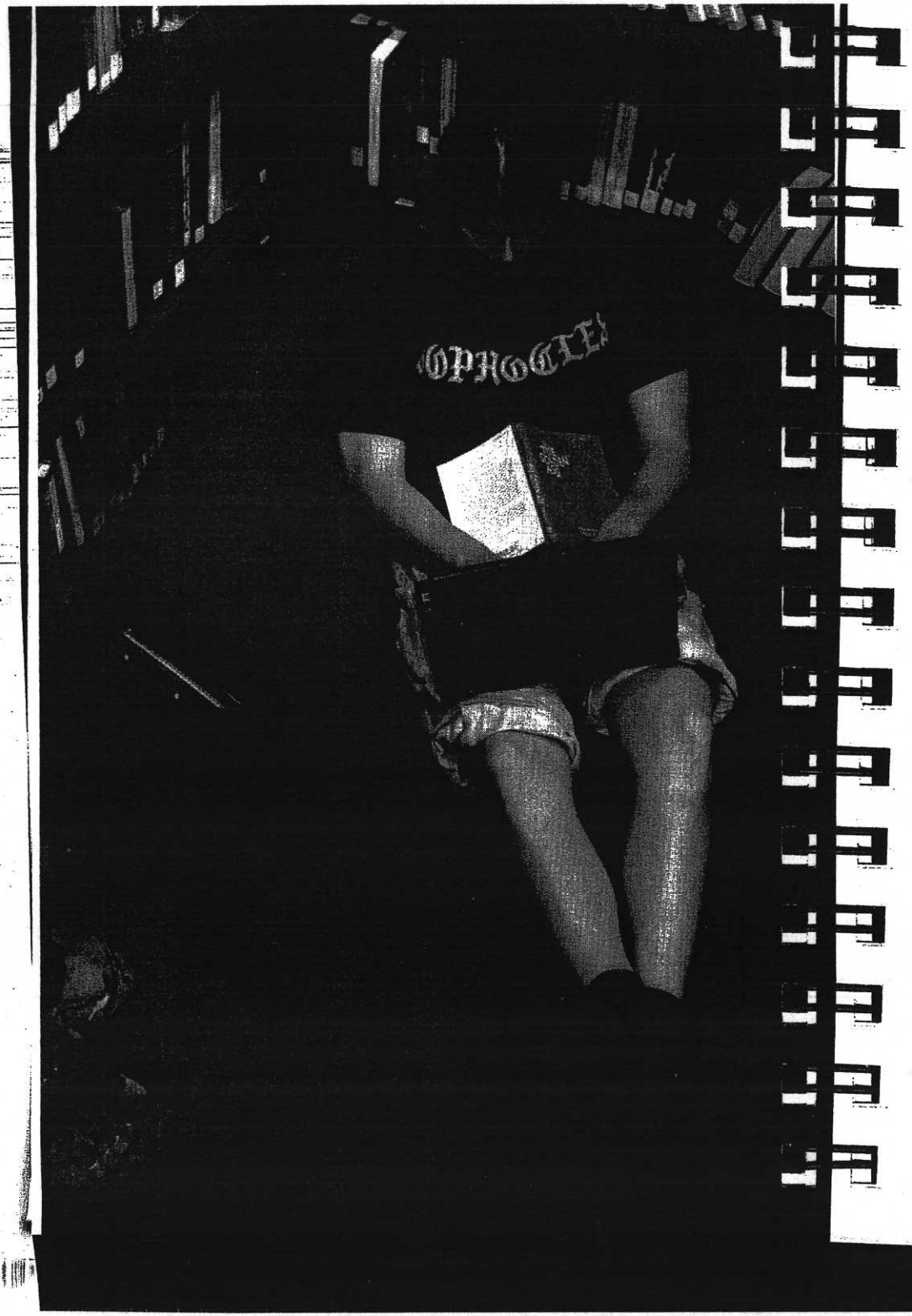

Reed College 2005-2006

The Educational Program

The Reed educational program pays particular attention to a balance between broad study in the various areas of human knowledge and close, in-depth study in a recognized academic discipline. All students take a one-year course in humanities. Distribution requirements that include the arts and humanities, 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 work with their faculty adviser to plan a program that meets departmental, divisional, and college requirements. They take a qualifying examination in their major field at the end of their junior year. Seniors engage in a one-year research project and prepare and defend a thesis based on that research.

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

Anthropology
Art
Biology
Chemistry
Chinese literature
Classics
Economics
English literature
French 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
Biochemistry and molecular biology
Chemistry–physics
Classics–religion
Dance–theatre
General literature
History–literature
International and comparative policy studies
Linguistics
Literature–theatre
Mathematics–economics
Mathematics–physics

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.

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.

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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 in a two- or three-year cycle.

Degree Requirements

To be eligible to receive the bachelor of arts degree from Reed College, students must fulfill eight basic requirements: sufficient units of academic work, college distribution requirements including Humanities 110, the physical education requirement, major departmental requirements, divisional requirements (except for the Division of Mathematics and Natural Sciences and the Division of Philosophy, Religion, and Psychology), junior qualifying examination, senior thesis, and senior oral examination. Descriptions of these requirements follow. The specific major requirements are found in the department listings, and divisional requirements are found in the division listings. Courses used to fulfill division requirements can also be used to fulfill college distribution requirements.

Credit Requirements

Academic credit at Reed is defined in terms of "units." A full course for one semester carries one Reed unit of credit, which is the equivalent of four semester-hours or six quarter-hours. The normal yearly program for students is from seven to nine academic units (excluding credit for physical education), in order to fulfill the 30 units required for graduation. The minimum program in a semester for full-time enrollment is three units.

The 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.

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 thesis year, in which a student must complete 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 thesis year is to be done while attending Reed, except in special programs such as the dual degree programs in computer science, engineering, forestry–environmental sciences, and visual arts (see "Dual Degree and Special Programs"). Such programs typically require three years of study at Reed and an additional two at the cooperating institution. Residence in Reed-approved study abroad programs will not count toward the college's two-year residence requirement.

College Distribution Requirements

The course distribution required of all Reed undergraduates is carefully designed and frequently re-evaluated to ensure the broad understanding of the arts and sciences signified by a liberal education. The distribution requirements changed, effective with the fall 2005 semester. Students readmitted or admitted to Reed as of fall 2005 must satisfy the requirements below. Continuing students may elect to complete the new requirements—including major and division—or the requirements of their catalog of entry.

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

1. Each group calls for two units in the same discipline.
2. No course may satisfy more than one group requirement. (For example, Humanities 210, 220, or 230 may be used for either Group A or Group B, but not for both.)
3. No student may fulfill more than one distribution requirement through work in his or her major department. In exception to this, students pursuing interdisciplinary majors may at the discretion of the major committee fulfill two distribution requirements through their major department(s).
4. No distribution requirement may be satisfied by a waiver, by independent study courses, by Advanced Placement or International Baccalaureate examination credit, or by courses taken for credit/no credit.
5. At most, only one of Humanities 210, 220, or 230 may be used to satisfy distribution requirements.
6. No distribution requirement may be satisfied by a course taken for credit/no credit.

Humanities

Humanities 110 is required of all freshmen and students who transfer with freshman standing but without transferable credit equivalent to 110. Students who transfer with sophomore or junior standing without transferable credit equivalent to 110 will fulfill this requirement by:

- taking Humanities 110, or
- completing Humanities 210, 220, or 230 and one additional unit from Group A or Group B (below).

Courses used to fulfill the humanities requirement may not be used to fulfill any other College distribution requirement.

Group A: Literature, Philosophy, Religion, 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, 372, 373, 374), dance (excluding applied), English, literature (both foreign and in translation), music (except applied), philosophy, religion, theatre (excluding acting and design), or one of Humanities 210, 220, or 230. (Notes: History majors may not meet this requirement with a 200-level

humanities course. Creative writing courses may not be used to meet the group A requirement.)

Group B: History, Social Sciences, and Psychology

Minimum of two units in the same department from one of the following: Anthropology 211 and one additional upper-division anthropology course; one 200-level Political Science course and any other political science course, but no more than one course from Political Science 230 (formerly 200) and 386–415; Economics 201 and one other economics course (except 401); Sociology 211 and one other sociology course; any two units in history or psychology; two units from Linguistics 296, 311, 312, 313, 332, 348, 373, 393 or 430; or one of Humanities 210, 220, or 230.

Group C: The Natural Sciences

Minimum of two units from the physical sciences (chemistry, physics) or two units from the biological sciences in courses that contain both lecture and laboratory components.

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

Minimum of two units either from:

1. Mathematics and formal or symbolic logic; or from
2. Foreign language (two units in one language—literature courses cannot be used to satisfy Group D) or linguistics (see the department listing for those courses that fulfill Group D).

Group X: Additional Breadth

In addition to these requirements, a student must complete two more units in any single department outside the student's major department.

Physical Education

Satisfactory completion of three semesters of approved activities is required before graduation. The program is administered as a minimal requirement in order to introduce students to physical education activities and to encourage them to participate. Each semester is divided into two quarters for physical education activities; six quarters of approved activities must be completed to meet the physical education requirement. Students are encouraged to complete this requirement in their first two years. Only one PE credit may be earned during any quarter. Students may receive up to two credits in self-directed classes—weight training or swim fitness. The remaining four credits must be completed in an instructional class.

Foreign Language

Proficiency in a foreign language as a requirement for graduation is a matter left to the discretion of the departments and divisions. Some stipulate a language requirement, and most departments or divisions 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.

Admission to a Major

Students must declare a major once they have completed 16 or more units, and should declare no later than the end of the sophomore year. If a student is enrolled in courses the completion of which would bring the student's total number of units to 16 or more, the student will not be allowed to register for subsequent semesters until declaring a major. 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 coursework 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 graduate.

In addition to the declaration of major, students declaring a double major or an ad hoc interdisciplinary major must also file a statement of the rationale for such a major. The departments involved will then review the statement 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.

Junior Qualifying Examination

After declaring the major, students must pass a qualifying examination administered by the major department and/or interdisciplinary committee 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 to gauge the student's mastery of his or her discipline or related disciplines, to serve as a diagnostic aid in identifying weaknesses in the student's preparation for advanced study or thesis work in that discipline, to assist the student in unifying his or her knowledge of a major field of study, and 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. 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. A second failure of the qualifying examination 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 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 coursework

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is discussed in full departmental or divisional meetings to assess the student's readiness to begin work on a thesis.

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, then 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.

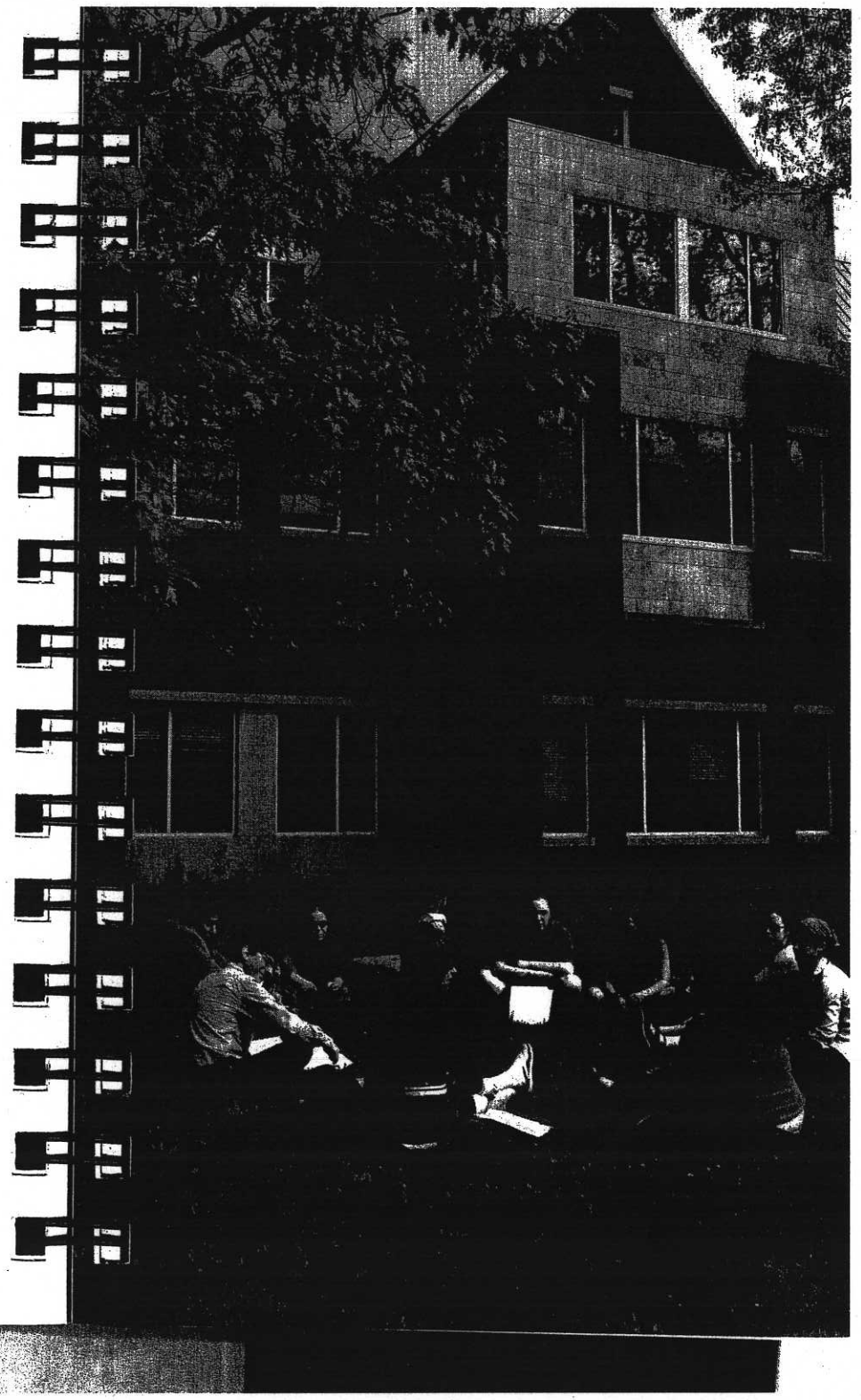
The candidate for graduation takes a final comprehensive two-hour oral review under the direction of the major division, department, and/or interdisciplinary committee. The oral examination may cover the work of the student's entire program, but emphasis is on the thesis and major field. The committee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

Teaching Methods

Instruction at Reed College emphasizes learning as a common adventure of students and teachers in which both cooperate closely in classes, group discussions, laboratories, and individual conferences. The faculty seeks to deal with students as individuals with differences of experience, attitudes, and interests that have important bearing on their development. On their part, students are expected to recognize the responsibility placed upon them to participate actively in the intellectual life of the college, to discover their educational objectives, and to strive to attain them.

The methods of instruction vary with the subject matter of the courses, the number in the class, and the judgment and personality of the instructor. Most courses are characterized by teaching based on conferences, studios, or laboratories, in which students and faculty members work closely together. In conferences ideas, facts, methods of analysis, and interpretations are exchanged, challenged, and defended by both students and faculty members, who jointly share responsibility for the learning process. Laboratory-based teaching allows students to become familiar with science as an active process of continuing inquiry.

Lectures play an important role in some courses but rarely an exclusive or dominating part. They are important in courses of large enrollment, or those of an introductory character, in stimulating thought, suggesting problems, and giving unity and connection to course material. But



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stability and folding, protein–ligand interactions, enzyme kinetics and catalysis, and the molecular mechanisms for gene regulation and protein biosynthesis. Computer-based molecular models are used to examine biomolecular structures in an interactive fashion. Prerequisite: Chemistry 201/202. Lecture.

392 Metabolic Biochemistry
One-half course for one semester. An exploration of the regulatory interrelationships among the numerous catalytic activities found in living cells with the goal of learning how and why cells molecularly maintain homeostasis. This will be accomplished by a detailed analysis of carbohydrate metabolism and its associated regulatory proteins (primarily enzymes) and related pathways. Emphasis will be placed on understanding the underlying thermodynamic and kinetic bases of energy metabolism and its regulation. Other related topics may include a survey of crucial biosynthetic and catabolic pathways, conservation of mechanism in catalyses of diverse reactions, supermolecular organization and channeling of metabolites, recent developments in understanding nitrogen metabolism, and the mechanism of ATP synthesis. Prerequisites: Chemistry 201/202 and 391, or consent of the instructor. Lecture-conference.

394 Biochemical Methods
One-half course for one semester. An introduction to the laboratory techniques commonly used in biochemistry. Experiments demonstrate methods used in the purification and characterization of proteins and polynucleotides and illustrate principles of enzyme kinetics, inhibition, and stereochemistry. Independent projects allow students to probe specific areas of interest. Prerequisites: Chemistry 391 or 392, or consent of the instructor. Lecture-laboratory.

401 Seminar in Structural Biochemistry
One-half course for one semester. An examination of current topics relating to structural biochemistry with an emphasis on the primary literature. Weekly writing assignments will support group discussion sessions. Participants will prepare a term paper and an oral presentation. The emphasis in 2005-06 will be the interactions of metal ions with biological molecules. Corequisite: Chemistry 391. Conference.

470 Thesis
Full course for one year.

481 Individual Work in Special Fields
One-half course for one semester.

Mathematics

James D. Fix
Computer science.

Albyn Jones
Statistics.

David Perkinson
Algebraic geometry.

James Pommersheim
Algebraic geometry, number theory, and quantum computation.

V. Rao Potluri
Algebra.

Joe Roberts
Number theory and combinatorics. On sabbatical and leave 2005-06.

Jerry Shurman
Number theory and complex analysis.

Irena Swanson
Commutative algebra.

Thomas W. Wieting
Differential geometry and ergodic theory.

The mathematics curriculum emphasizes solving problems by rigorous methods that use both calculation and structure. Starting from the freshman year, students discuss the subject intensely among themselves outside the classroom and learn to write lucid arguments.

The major is grounded in analysis and algebra through the four years of study. A student typically will also take upper-division courses in areas such as computer science, probability and statistics, combinatorics, and the topics of the senior-level courses that change from year to year. In particular, the department offers a range of upper-division computer science offerings, while recent topics courses have covered elliptic curves, polytopes, modular forms, Lie groups, representation theory, and hyperbolic geometry. A year of physics is required for the degree. The year-long senior thesis involves working closely with a faculty member on a topic of the student's choice.

The department has a dedicated computer laboratory for majors. Mathematics majors sometimes conduct summer research projects with the faculty, attend conferences, and present papers, but it is more common to participate in a Research Experience in Mathematics (REU) program elsewhere to broaden experience. Many students from the department have enrolled in the Budapest Semester in Mathematics program to study in Hungary.

Graduates from the mathematics department have completed Ph.D. programs in pure and applied mathematics, computer science and engineering, statistics and biostatistics, and related fields such as physics and economics. Graduates have also entered professional careers such as finance, law, medicine, and architecture.

First-year students who plan to take a full year of mathematics can select among Calculus (Mathematics 111), Introduction to Analysis (Mathematics 112), Introduction to Computing (Mathematics 121), Introduction to Combinatorics (Mathematics 132), or Introduction to Probability and Statistics (Mathematics 141). Calculus, Computing and Combinatorics are offered only in the fall, while Analysis is offered in the spring, and Probability and Statistics is offered both semesters. The prerequisite for all of these courses except Analysis is three years of high school mathematics. The prerequisite for Analysis is a solid background in calculus, usually the course at Reed or a year of high school calculus with a score of 4 or 5 on the AP exam. Students who intend to go beyond the first-year classes should consult with their

adviser. In all cases it is recommended to consult a member of the mathematics department to help determine a program.

The mathematics department's web page can be found at http://academic.reed.edu/math/.

Requirements for the Major

1. Mathematics 111, 112, 211, and 212.
2. Mathematics 321, 331, and 332.
3. Four additional units in mathematics courses numbered higher than 300 (excluding Mathematics 470).
4. Physics 100 or the equivalent.
5. Mathematics 470.

111 Calculus
Full course for one semester. This includes a treatment of limits, continuity, derivatives, mean value theorem, integration—including the fundamental theorem of calculus, and definitions of the trigonometric, logarithmic, and exponential functions. Prerequisite: three years of high school mathematics. Lecture-conference.

112 Introduction to Analysis
Full course for one semester. Field axioms, the real and complex fields, sequences and series. Complex functions, continuity and differentiation; power series and the complex exponential. Prerequisite: Mathematics 111 or equivalent. Lecture-conference.

121 Introduction to Computing
Full course for one semester. An introduction to computer science, covering topics such as elementary data structures, algorithms, computability, floating point computations, and programming in a high-level language. Prerequisite: three years of high school mathematics. Lecture-conference and lab.

132 Introduction to Combinatorics
Full course for one semester. Permutations and combinations, finite mathematical structures, inclusion-exclusion principle, elements of the theory of graphs, permutation groups, and the rudiments of Pólya theory will be discussed. Prerequisite: three years of high school mathematics. Lecture-conference.

141 Introduction to Probability and Statistics
Full course for one semester. The basic ideas of probability including properties of expectation, the Law of Large Numbers, and the Central Limit Theorem are discussed. These ideas are applied to the problems of statistical inference, including estimation and hypothesis testing. The linear regression model is introduced, and the problems of statistical inference and model validation are studied in this context. A portion of the course is devoted to statistical computing and graphics. Prerequisite: three years of high school mathematics. Lecture-conference and lab.

211 Multivariable Calculus I
Full course for one semester. A development of the basic theorems of multivariable differential calculus, optimization, and Taylor series. Inverse and implicit function theorems may be included. Prerequisite: Mathematics 112 or consent of the instructor. Lecture-conference.

212 Multivariable Calculus II
Full course for one semester. A study of line, multiple, and surface integrals, including Green's and Stokes' theorems; linear differential equations. Differential geometry of curves and surfaces or Fourier series may be included. Prerequisite: Mathematics 211 or consent of the instructor. Lecture-conference.

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311 Complex Analysis
Full course for one semester. A study of complex valued functions: Cauchy's Theorem and residue theorem, Laurent series, and analytic continuation. Prerequisite: Mathematics 212. Lecture-conference.

321 Real Analysis
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 212. Mathematics 331 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, qualitative theory, numerical methods. Prerequisite: Mathematics 212 and Mathematics 331. Lecture-conference. Offered in alternate years.

331 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. Prerequisite: Mathematics 211 or consent of the instructor. Lecture-conference.

332 Abstract Algebra
Full course for one semester. An elementary treatment of the algebraic structure of groups, rings, fields, and/or algebras. Prerequisite: Mathematics 331. Lecture-conference.

341 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 consent of the instructor. Lecture-conference. Offered in alternate years. Not offered 2005-06.

351 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, and general theory of formal systems. Prerequisite: two years of college mathematics. Lecture-conference. Offered in alternate years.

361 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: Mathematics 331 or consent of the instructor. Mathematics 332 is recommended. Lecture-conference. Offered in alternate years. Not offered 2005-06.

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, and permutation groups and Pólya 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 211. Lecture-conference. Offered in alternate years. Not offered 2005-06.

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: Mathematics 121 and Mathematics 211 or consent of the instructor. Lecture-conference.

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384 Programming Language Design and Implementation
Full course for one semester. A study of the organization and structure of modern programming languages. This course will survey key programming language paradigms including functional, object-oriented, and logic and constraint-based languages. A formal approach will be taken to understanding the fundamental concepts underlying these paradigms, including their syntax, semantics, and type systems. The course will cover selected topics in the implementation of language systems such as parsers, interpreters, and compilers, and of run-time support for high-level languages. Prerequisite: Mathematics 121. Lecture-conference. Offered in alternate years.

385 Computer Graphics
Full course for one semester. Introduction to computer image synthesis and mathematical modeling for computer graphics applications. Topics include image processing, 2D and 3D modeling techniques such as curve and surface representation, geometric algorithms such as collision detection and hidden surface removal, 3D rendering, and animation. Students will gain experience implementing a number of these techniques through projects. Prerequisites: Mathematics 382 or equivalent computer programming experience and Mathematics 211. Mathematics 331 recommended. Lecture-conference. Offered in alternate years. Not offered 2005-06.

391 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, and measure-theoretic development of probability theory. Prerequisite: Mathematics 212. Lecture-conference.

392 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 391 or consent of the instructor. Lecture-conference. Offered in alternate years.

411 Topics in Advanced Analysis
Full course for one semester. Topics selected by the instructor. Prerequisite: Mathematics 321 or consent of the instructor. Lecture-conference.

412 Topics in Algebra
Full course for one semester. Topics selected by the instructor, for example, commutative algebra, Galois theory, algebraic geometry, and group representation theory. Prerequisite: Mathematics 332 or consent of the instructor. Lecture-conference.

441 Topics in Computer Science Theory
Full course for one semester. Exploration of topics from advanced algorithm design and theoretical computer science including complexity theory, cryptography, computational geometry, and randomized algorithms, as selected by the instructor. Prerequisite: Mathematics 382 or consent of the instructor. Lecture-conference. Offered in alternate years. Not offered 2005-06.

442 Topics in Computer Science Systems
Full course for one semester. A study of the design and implementation techniques used in a particular area of computer science as selected by the instructor. Students will implement a working system in that area. Recent offerings have covered distributed and networked systems, compilers, and computer game design. Prerequisite: Mathematics 382 or consent of the instructor. Lecture-conference. Offered in alternate years.

470 Thesis
Full course for one year.

481 Independent Study
One-half course for one semester. Independent reading primarily for upper-class students. Prerequisite: approval of instructor and division.

Physics

Danielle A. Braje
Nonlinear optics.

Richard E. Crandall
Quantum theory, signal processing, interdisciplinary problems, scientific computing.

John Essick
Solid state physics, atom trapping.

Joel S. Franklin
Field theory, computation.

David J. Griffiths
Classical electrodynamics, elementary particle theory.

Mary B. James
Accelerator physics, classical electrodynamics, physics outreach. On sabbatical and leave 2005-06.

John W. Powell
Neural biophysics, astrophysics, Fourier transform infrared spectroscopy.

Nicholas A. Wheeler
Mathematical physics.

Physics is the most mature of the sciences and provides much of the conceptual apparatus and instrumentation for chemistry, biology, astronomy, and engineering. It has inspired the creative work of mathematicians, philosophers, and social scientists and has repeatedly transformed the framework of civilization. The physics curriculum at Reed College is designed to provide rigorous preparation for those who plan careers in the field while at the same time serving the needs of all interested liberal arts students.

The typical physics major takes Physics 100 as a freshman and Physics 200 as a sophomore; these courses survey the field from a broad perspective and lay the groundwork for more concentrated study in the last two years. Juniors ordinarily take Classical Mechanics (311), Quantum Mechanics (342), Electrodynamics (321 and 322), and Advanced Laboratory (331 and 332); these courses provide a thorough background for a wide range of possible thesis projects in the senior year. Optional courses include Optics, Thermal Physics, Solid State Physics, Astrophysics, Molecular Biophysics, Elementary Particles, Scientific Computation, and Classical Field Theory, as well as Advanced Classical Mechanics and Advanced Quantum Mechanics. Individual or group seminar courses in more specialized topics can usually be arranged at the student's request.