Degrees and Courses of Study

Vassar College offers a balanced course of study leading to the degree of Bachelor of Arts. To permit flexibility, it also offers an opportunity for a four-year program leading to a combined Bachelor of Arts and Master of Arts or Science degree in a limited number of specified areas. It encourages students to pursue the degree through the development of a coherent program of study that recognizes, as much as possible, individual needs.

Requirements for the Degree of Bachelor of Arts

Units

Each candidate for the bachelor of arts degree is required to complete 34 units of work, equivalent to the standard of 120 semester hours recognized by the Board of Regents of the University of the State of New York. The system of units is fourfold:
- a) the single unit, a course for one semester
- b) the half unit, equivalent to one-half of a semester course taken over an entire semester or for a half-semester only
- c) the double unit, consisting of a year sequence of semester courses or the equivalent of two semester courses in one term
- d) the unit and a half earned in one course over one semester

Freshman Course, Quantitative Course, and Foreign Language Requirements

All graduates must comply with the Freshman Course requirement, the Quantitative Course requirement, and the foreign language proficiency requirement as described on page 44.

Residence

Four years of full-time enrollment is the usual length of time expected for the baccalaureate degree. However, students may be permitted to spend a longer or shorter time. The fact that many students will benefit from a break in the four-year sequence is acknowledged and reflected in the residence requirement. While students are expected to make orderly progress toward the degree, they are encouraged to move at the pace and in the fashion which suits their needs and those of their chosen program. Students who want to accelerate their degree program should consult with the Dean of Studies.

Residence Requirement

1. A student choosing a regular four-year program must spend at least three of those years in residence.
2. Students on a three-year program (accelerating students, those entering with a considerable number of prematriculation Advanced Placement credits, those transferring after one year at another college) would normally be expected to spend two and one-half years in residence. If special one-year off-campus programs—e.g., Junior Year Away or academic leave of absence—were deemed essential to their studies, the residence requirement would be reduced to two years in those cases by permission of the Committee on Leaves and Privileges.
3. Students entering Vassar as juniors must spend two years in residence and elect at least 17 units—the minimim amount of Vassar work required of transfer students for a Vassar baccalaureate degree.
4. Any special permissions relating to the residence requirement (academic leaves of absence, acceleration) must be sought individually from the Committee on

399a or b. Senior Independent Research (½ or 1)
By special permission.

Approved Courses

[Africana Studies 211.]	Religions of the Oppressed and Third World Liberation Movements	(1)
Anthropology 245.	The Ethnographer's Craft	(1)
Economics 248.	International Trade and the World Financial System	(1)
Economics 268.	Economic Development in Less Developed Countries	(1)
[Geography 240.]	Latin America: Regional Development, Environment, and Urbanization	(1)
[Geography 242.]	Brazil: Urbanization and Environment in Portuguese America	(1)
Geography 247a.	The U.S.-Mexico Border: Region, Place, and Process	(1)
Hispanic-Studies 105-106.	Elementary Spanish Language	(1)
Hispanic-Studies 205.	Intermediate Spanish	(1)
Hispanic Studies 206.	Reading and Writing about Hispanic Culture	(1)
Hispanic Studies 216.	Methods in Interdisciplinary Analysis	(1)
Hispanic Studies 227.	Colonial Latin America	(1)
Hispanic Studies 229.	Postcolonial Latin America:	(1)
Hispanic Studies 387a.	Latin American Seminar	(1)
Hispanic Studies 387b.	Latin American Seminar	(1)
History 162a.	Latin America: The Aftermath of Encounter	(1)
[History 251a.]	A History of American Foreign Relations	(1)
History 262a.	Early Latin America to 1750	(1)
[History 263b.]	From Colony to Nation: Latin America in the Nineteenth Century	(1)
History 264b.	The Revolutionary Option? Latin America in the Twentieth Century	(1)
[History 361b.]	Varieties of the Latin American Indian Experience]	(1)
History 362b.	The Cuban Revolution	(1)
[History 363b.]	Revolution and Conflict in Twentieth-Century Latin America	(1)
Political Science 252.	Politics of Modern Social Movements	(1)
Political Science 258a.	Latin American Politics	(1)
Political Science 355b.	Seminar on Violence	(1)
Portuguese.	First, Second and Third Year of Spoken Language (Self-Instructional Language Program)	(1)
[Religion 211.]	Religions of the Oppressed and Third-World Liberation Movements	(1)

Mathematics

Professors: John Feroe, John McCleary, Peter C. Pappas, Charles I. Steinhorn[b]; Associate Professor: Benjamin A. Lotto; (Chair) Assistant Professors: Heather Johnston; Natalie Priebe Frank[a]; Visiting Assistant Professor: HeeSook Park; Adjunct Instructor: Doris Haas*.

Requirements for Concentration: Mathematics 121/122 (or 125 or permission of the department to enroll in 221), 9½ units above the 100-level including Mathematics 221/222, 301, 321, 361, and two other units at the 300-level. Reading courses are not counted among the required units. Work used to satisfy major requirements may not be taken NRO after declaration of the major. At most one unit at the 300-level taken NRO prior to declaration of the major may be used to satisfy major requirements.

Senior Year Requirements: Mathematics 301.

Recommendations: Majors are strongly urged to elect at least 2 units in applications of mathematics to other fields. A reading knowledge of French, German, or Russian is advised for those contemplating graduate study.

Sequence of Courses for Concentration: Incoming students will normally elect Mathematics 121/122, 221/222, but freshman eligible for Advanced Placement should confer with the department. Election of advanced courses should be made in consultation with a departmental adviser.

Prospective majors in mathematics are strongly advised to complete Mathematics 121/122 or Mathematics 125 by the end of the freshman year and Mathematics 221/222 by the end of the sophomore year. In any case, the first sequence must be completed by the end of the sophomore year in order to declare the major and Mathematics 221/222 must be completed by the end of the junior year.

Advisers: The department.

Correlate Sequence in Mathematics: Students majoring in other programs may complement their study by electing a correlate sequence in mathematics. Course selection should be made in consultation with the department and the major adviser to ensure exposure to the mathematics most useful to the field of concentration.

Requirements for the Correlate Sequence: Mathematics 121/122 (or its equivalent through advanced placement, 125, or permission of the department to enroll in 221), 4 graded units above the 100-level including 221/222. At least one of the 4 graded units must be at the 300-level.

Advanced Placement: Students receiving 1 unit of Advanced Placement credit based on either the AB or BC Mathematics Advanced Placement Examination or the calculus credit examination administered by the Department of Mathematics may not be granted credit for Mathematics 101 or 121.

The department recommends that students who have earned a 4 or 5 on the BC examination or a 3 on the AB examination enroll in Mathematics 221. Students with a 5 on the AB examination generally are advised to elect Mathematics 221 also, after conferring with the department. Students with a 4 on the AB examination ordinarily are advised to enroll in Mathematics 125, but should consult with the department.

I. Introductory

100a-101b. Pre-Calculus and Introduction to Calculus (½, 1)
This sequence is designed for students who wish to take Mathematics 101, Introduction to Calculus, but whose mathematical background is deficient.

II. Intermediate

Prerequisite for all intermediate courses: Mathematics 122, 125 or equivalent, unless otherwise indicated.

221a and b. Linear Algebra (1)

The theory of higher dimensional space. Topics include: geometric properties of n-space, matrices and linear equations, vector spaces, linear mappings, determinants. The department.

222a and b. Multivariable Calculus (1)

Continuation of Mathematics 221. Differential calculus of vector functions, implicit function theorem, extreme values, multiple integrals, vector field theory. The department.

Prerequisite: Mathematics 221 or the equivalent, or permission of the instructor.

228b. Methods of Applied Mathematics (1)

Survey of techniques used in the physical sciences. Topics include: ordinary and partial differential equations, series representation of functions, integral transforms, Fourier series and integrals. The department.

231a or b. Topics in Geometry (1)

Topics to be chosen from: conic sections, transformational geometry, Euclidean geometry, affine geometry, projective geometry, inversive geometry, non-Euclidean geometry, spherical geometry, convexity, fractal geometry, solid geometry, foundations of geometry. The department.

Alternate years: offered in 2004/05.

241a. Probability Models (1)

A presentation of commonly applied discrete and continuous probability distributions, including the use of expectation, independence, conditional probability, and related statistical concepts. The department.

261a. Introduction to Number Theory (1)

Topics include: divisibility, congruence, modular arithmetic, diophantine equations, number-theoretic functions, distribution of the prime numbers. The department.

263b. Discrete Mathematics (1)

Mathematical induction, elements of set theory and logic, permutations and combinations, relations, topics in graph theory, generating functions, recurrence relations, Boolean algebras. The department.

290. Field Work (½ or 1)

Reading Courses

Prerequisite: Mathematics 221 or equivalent, and permission of instructor.

297. Topics in Mathematics (½)

298. Independent Work (½ or 1)

Election should be made in consultation with a department adviser.

III. Advanced

Prerequisite for all advanced courses: Mathematics 222, unless otherwise indicated.

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ematics 101. Topics of Mathematics 100 include the algebra of polynomials, operations with fractions, solving equations and inequalities, exponents and radicals, elements of coordinate geometry, functions and their graphs, logarithms and elements of trigonometry. Ms. Haas.

On the satisfactory completion of Mathematics 101, the student receives ½ unit of credit for Mathematics 100.

Not open to students with AP credit in mathematics or students who have completed Mathematics 101 or 121.

Prerequisite: high school mathematics. Advice of the department should be sought before registering for this course.

101b/102a.

101b. Introduction to Calculus (1)

A course intended for students not majoring in mathematics or the physical sciences who need a working knowledge of calculus. The course emphasizes techniques and applications with relatively little attention to the rigorous foundations. The department.

Not open to those who have had Mathematics 121 or its equivalent.

Does not serve as a prerequisite for Mathematics 122, 125, or 200-level mathematics courses.

Prerequisite: at least three years of high school mathematics.

Three 50-minute periods.

102a. Topics in Calculus (1)

A continuation of Mathematics 101. Topics may include: matrix methods, use of differentiation and integration, differential equations, and partial differentiation. Emphasis is on techniques and applications. The department.

Not open to those who have had Mathematics 122.

Does not serve as a prerequisite for 200-level mathematics courses.

Prerequisite: Mathematics 101 or equivalent.

121a/122b. Single Variable Calculus (1)

The calculus of one variable and applications are discussed. Topics include: limits, continuity, derivatives, applications of derivatives, transcendental functions, the definite integral, applications of definite integrals, approximation methods, differential equations, sequences, and series. The department.

Not open to those who have had Mathematics 101.

Prerequisite: a minimum of three years of high school mathematics, preferably including trigonometry.

Three 50-minute periods; one 50-minute problem session.

125a. Topics in Single Variable Calculus (1)

Material from Mathematics 121/122 presented in one semester for students with previous experience with calculus. Topics in second-semester calculus are fully developed and topics in first-semester calculus are reviewed. The department.

Three 50-minute periods; one 50-minute problem session.

131a. Numbers, Shape, Chance, and Change (1)

What is the stuff of mathematics? What do mathematicians do? Fundamental concepts from arithmetic, geometry, probability, and the calculus are explored, emphasizing the relations among these diverse areas, their internal logic, their beauty, and how they come together to form a unified discipline. As a counterpoint, we also discuss the "unreasonable effectiveness" of mathematics in describing a stunning range of phenomena from the natural and social worlds. The department.

Prerequisites: at least three years of high school mathematics.

Two 50-minute lectures and one 50-minute discussion per week.

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301b. Senior Seminar   (½)
Areas of study and units of credit vary from year to year. The department.
  Open only to seniors whose major is mathematics.

321a. Real Analysis   (1)
A rigorous treatment of topics in the classical theory of functions of a real variable from the point of view of metric space topology including limits, continuity, sequences and series of functions, and the Riemann-Stieltjes integral. The department.

324a or b. Complex Analysis   (1)
Integration and differentiation in the complex plane. Topics include: holomorphic (differentiable) functions, power series as holomorphic functions, Taylor and Laurent series, singularities and residues, complex integration and, in particular, Cauchy's Theorem and its consequences. The department.

[327b. Advanced Topics in Real Analysis]   (1)
Continuation of Mathematics 321. Measure theory, the Lebesgue integral, Banach spaces of measurable functions. The department.
  Prerequisite: Mathematics 321.
  Alternate years: not offered in 2004/05.

328b. Theory of Differential Equations   (1)
Existence and uniqueness theorems for ordinary differential equations; general theory and eigenvalue methods for first order linear systems. The department.
  Prerequisite: Mathematics 321 or permission of instructor.
  Alternate years: offered in 2004/05.

[335a or b. Topics in Differential Geometry and Topology]   (1)
Aspects of the elementary geometry and topology of differentiable manifolds. Topics vary from year to year. The department.
  Prerequisite: Mathematics 321.
  Alternate years: not offered in 2004/05.

[336a or b. Algebraic Geometry]   (1)
An introduction to the study of algebraic geometry. Topics may include: projective space, homogeneous coordinates, plane curves, Bezout's theorem, elliptic curves, affine and projective varieties, the Zariski topology, coordinate rings, functions on varieties. The department.
  Prerequisite: Mathematics 361.
  Alternate years: not offered in 2004/05.

339a or b. Topology   (1)
Introductory point-set and algebraic topology; topological spaces, metric spaces, continuous mappings, connectedness, compactness and separation properties; the fundamental group; simplicial homology. The department.
  Prerequisite: Mathematics 321 or 361.
  Alternate years: offered in 2004/05.

[341b. Mathematical Statistics]   (1)
The rigorous development of topics in mathematical statistics: probability and distributions; multivariate distributions; special distributions; distributions of functions of several variables; limiting distributions; introduction to statistical inference. Additional topics drawn from sufficient statistics, estimation theory,

  Prerequisite: Mathematics 222 and 241.
  Alternate years: not offered in 2004/05.

[351a. Foundations of Mathematics]   (1)
An introduction to mathematical logic. Topics are drawn from computability theory, model theory, and set theory. Mathematical and philosophical implications also are discussed. The department.
  Prerequisite: Mathematics 321 or 361.
  Alternate years: not offered in 2004/05.

361b. Modern Algebra   (1)
The theory of groups and an introduction to ring theory. Topics in group theory include: isomorphism theorems, generators and relations, group actions, Sylow theorems, fundamental theorem of finite abelian groups. The department.

364a or b. Advanced Linear Algebra   (1)
Further study in the theory of vector spaces and linear maps. Topics may include: scalar products and dual space; symmetric, hermitian and unitary operators; eigenvectors and eigenvalues; spectral theorems; canonical forms. The department.

367a. Advanced Topics in Modern Algebra   (1)
Continuation of Mathematics 361. Rings and fields, with a particular emphasis on Galois theory. The department.
  Prerequisite: Mathematics 361.
  Alternate years: offered in 2004/05.

[380a or b. Topics in Advanced Mathematics]   (1)
Advanced study in an area of mathematics. The department.
  Alternate years: not offered in 2003/04.

399. Senior Independent Work   (½ or 1)
Election requires the approval of a departmental adviser and of the instructor who supervises the work.