MATH17 Introductory Calculus
This course is designed to introduce basic ideas and techniques of differential calculus. Students should enter with sound precalculus skills but with very limited or no prior study of calculus. Topics to be considered include differential calculus of algebraic, exponential, and logarithmic functions. (Integral calculus will be introduced in MATH118.)
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH18 Introductory Calculus II: Integration and Its Applications
This course continues MATH17 and is designed to introduce basic ideas and techniques of calculus. Students should enter MATH118 with sound precalculus skills and with very limited or no prior study of integral calculus. Topics to be considered include differential and integral calculus of algebraic, exponential, and logarithmic functions.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH19 Elements of Calculus, Part I
This course is the first half of a two-semester calculus sequence (MATH119 & MATH120). This sequence is designed for students who have not previously studied calculus. The course, together with MATH120, will cover limits, derivatives, and integrals. Exponential, logarithmic, and trigonometric functions will be introduced and their calculus will be studied. Applications of calculus to biology, economics, physics, and/or other fields will be emphasized. Completion of both semesters (MATH119 and MATH120) is required to receive credit for MATH 119.
Offering: Host
Grading: Amp Graded
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH20 Elements of Calculus, Part II
This course is the second half of a two-semester calculus sequence (an ampersand (&) course). This sequence is designed for students who have not previously studied calculus. The course, together with MATH119, will cover limits, derivatives, and integrals. Exponential, logarithmic, and trigonometric functions will be introduced and their calculus will be studied. Applications of calculus to biology, economics, physics, and/or other fields will be emphasized. Completion of both semesters (MATH119 and MATH120) is required to receive credit for MATH119.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH119

MATH21 Calculus I, Part I
MATH21 is designed for students who have completed a high school calculus course and who might pursue study in an area for which calculus is an essential tool but who are not prepared to place out of calculus. This course is a deeper and broader study of calculus than MATH117; theoretical aspects are not the main focus but will not be avoided. The course will, together with MATH122, treat limits, derivatives, and integrals; the calculus of exponential, logarithmic, trigonometric, and inverse trigonometric functions; techniques of integration; plane analytic geometry; various applications of calculus; and sequences and series, including power series and intervals of convergence.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH22 Calculus I, Part II
The continuation of MATH21. Topics covered include techniques and applications of integration and an introduction to sequences and series.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH30 Elementary Statistics
Topics included in this course are organizing data, central measures, measures of variation, distributions, sampling, estimation, conditional probability (Bayes’ theorem), hypothesis testing, simple regression and correlation, and analysis of variation.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH31 Problem Solving for the Putnam
This course will explore the problems and problem-solving techniques of the annual William Lowell Putnam mathematical competition. Particular emphasis will be placed on learning to write clear and complete solutions to problems. The competition is open to all undergraduate students.
Offering: Host
Grading: Cr/U
Credits: 0.25
Gen Ed Area: NSM-MATH
Prereq: None

MATH32 Vectors and Matrices
This is a course in the algebra of matrices and Euclidean spaces that emphasize the concrete and geometric. Topics to be developed include solving systems of linear equations; matrix addition, scalar multiplication, and multiplication; properties of invertible matrices; determinants; elements of the theory of abstract finite dimensional real vector spaces; dimension of vector spaces; and the rank of a matrix. These ideas are used to develop basic ideas of Euclidean geometry and to illustrate the behavior of linear systems. We conclude with a discussion of eigenvalues and the diagonalization of matrices.
Offering: Host
Grading: A-F
MATH222 Multivariable Calculus
This course treats the basic aspects of differential and integral calculus of functions of several real variables, with emphasis on the development of calculational skills. The areas covered include scalar- and vector-valued functions of several variables, their derivatives, and their integrals; the nature of extremal values of such functions and methods for calculating these values; and the theorems of Green and Stokes.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH223 Linear Algebra
An alternative to MATH221, this course will cover vector spaces, inner-product spaces, dimension theory, linear transformations and matrices, determinants, eigenvalues and eigenvectors, Hermitian and unitary transformations, and elementary spectral theory. It will present applications to analytic geometry, quadratic forms, and differential equations as time permits. The approach here is more abstract than that in MATH221, though many topics appear in both.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH225 Fundamentals of Analysis: An Introduction to Real Analysis
In this rigorous treatment of calculus, topics will include, but are not limited to, real numbers, limits, sequences and series, continuity and uniform continuity, differentiation, the Riemann integral, sequences and series of functions, pointwise and uniform convergence of functions, and interchange of limiting processes. MATH228 or comparable experience in writing mathematical proofs is strongly recommended for success in this course.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH226 Complex Analysis
This course will present the basic properties of complex analytic functions. We begin with the complex numbers themselves and elementary functions and their mapping properties, then discuss Cauchy's integral theorem and Cauchy's integral formula and applications, Taylor and Laurent series, zeros and poles and residue theorems, the argument principle, and Rouche's theorem. In addition to a rigorous introduction to complex analysis, students will gain experience in communicating mathematical ideas and proofs effectively.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: (MATH222 AND MATH221) OR (MATH222 AND MATH223)

MATH228 Discrete Mathematics
This course is a survey of discrete mathematical processes. Students will be introduced to the process of writing formal mathematical proofs, including mathematical induction. Topics may include set theory, logic, number theory, finite fields, permutations, elementary combinatorics, or graph theory.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None
illustrate topology's power by seeing important applications to other areas of mathematics.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: None

MATH245 Algebraic Topology
This course will use linear algebra to learn about interesting general properties of shapes. The major goal will be the classification of closed, bounded surfaces such as the sphere, the torus, the Klein bottle, and the projective plane. We will introduce the point-set topology and the new linear algebra that we need, but MATH221 or 223 is essential for this course.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: (MATH221 AND MATH222) OR (MATH223 AND MATH222)

MATH252 Differential Forms
This class will be an introduction to differential forms, a central tool in modern topology, geometry, and physics. The course begins where MATH222 ends, with Green's theorem, the divergence theorem, and Stokes' theorem. All of these theorems are special cases of one theorem, known as the general Stokes' theorem, about integration of differential forms. The objective of the first part of the course will be to understand and prove this theorem. We will then discuss manifolds and what can be learned about them using differential forms, concentrating on de Rham cohomology.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: (MATH221 AND MATH222) OR (MATH222 AND MATH223)

MATH255 Fundamentals of Analysis II
Topics to be addressed include the topology of metric spaces (continuity, connectedness, and compactness), convergence of sequences and series of functions, spaces of functions and their topologies, and the Lebesgue integral on the line) and its basic convergence theorems, and Fourier series.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH225

MATH261 Abstract Algebra: Groups, Rings, and Fields
This course is an introduction to abstract algebra, a core area of mathematics: the study of the basic properties of structures, with emphasis on fundamental results about groups and rings. MATH228, or comparable experience in writing proofs and in abstract reasoning, is strongly recommended.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH225

MATH262 Abstract Algebra
This continuation of MATH261 will discuss fields and Galois theory. Additional topics will be covered as time permits.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH261

MATH272 Elementary Number Theory
This is a course in the elements of the theory of numbers. Topics covered include divisibility, congruences, quadratic reciprocity, Diophantine equations, and a brief introduction to algebraic numbers.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH228

MATH273 Combinatorics
This course will present a broad, comprehensive survey of combinatorics. Topics may include partitions, the topic of inclusion-exclusion, generating functions, recurrence relations, partially ordered sets, trees, graphs, and minimax theorems.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH228

MATH274 Graph Theory
A graph is a set V of elements called vertices and a set E of pairs of elements of V called edges. From this simple definition, many elegant models have been developed. Indeed, graph theory is essential to applications of computer science to network analysis and planar mapping. This course will be an introduction to graph theory with an emphasis on the connections between graph theory and linear algebra.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH221 OR MATH223

MATH275 Probabilistic Graphical Models
Graphical models are used to represent complex, uncertain relationships among several, possibly very many, variables. They are fundamental in many domains of application, including medical diagnosis and prognosis, vision and image processing, robotics, and computational biology. This course will familiarize students with the graph theory and probability theory needed to discuss graphical models. After that, students will investigate exact and approximate statistical inference for graphical models, learning/inference of parameters, and possibly learning of graph structure.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: MATH222

MATH283 Differential Geometry
This course is an introduction to the classical differential geometry of curves and surfaces in Euclidean 3-space. Topics from global differential geometry and extensions to higher dimensions will be considered as time and the background of the students permit.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-MATH
Prereq: (MATH222 AND MATH221) OR (MATH222 AND MATH223)

MATH401 Individual Tutorial, Undergraduate
Topic to be arranged in consultation with the tutor.

Offering: Host
Grading: OPT
MATH402 Individual Tutorial, Undergraduate
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH407 Senior Tutorial (downgraded thesis)
Downgraded Senior Thesis Tutorial - Project to be arranged in consultation with the tutor. Only enrolled in through the Honors Coordinator.
Offering: Host
Grading: A-F

MATH408 Senior Tutorial (downgraded thesis)
Downgraded Senior Thesis Tutorial - Project to be arranged in consultation with the tutor. Only enrolled in through the Honors Coordinator.
Offering: Host
Grading: A-F

MATH409 Senior Thesis Tutorial
Topics to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH410 Senior Thesis Tutorial
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH411 Group Tutorial, Undergraduate
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH412 Group Tutorial, Undergraduate
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH419 Student Forum
Student-run group tutorial, sponsored by a faculty member and approved by the chair of a department or program.
Offering: Host
Grading: Cr/U

MATH421 Undergraduate Research, Science
Individual research projects for undergraduate students supervised by faculty members.
Offering: Host
Grading: OPT

MATH422 Undergraduate Research, Science
Individual research projects for undergraduate students supervised by faculty members.
Offering: Host
Grading: OPT

MATH423 Advanced Research Seminar, Undergraduate
Advanced research tutorial; project to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH424 Advanced Research Seminar, Undergraduate
Advanced research tutorial; project to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH465 Education in the Field, Undergraduate
Students must consult with the department and class dean in advance of undertaking education in the field for approval of the nature of the responsibilities and method of evaluation.
Offering: Crosslisting
Grading: Cr/U
Credits: 0.50
Gen Ed Area: None

MATH466 Education in the Field, Undergraduate
Students must consult with the department and class dean in advance of undertaking education in the field for approval of the nature of the responsibilities and method of evaluation.
Offering: Host
Grading: OPT

MATH469 Education in the Field, Undergraduate
Students must consult with the department and class dean in advance of undertaking education in the field for approval of the nature of the responsibilities and method of evaluation.
Offering: Host
Grading: OPT
Credits: 1.00
Gen Ed Area: None
Prereq: None

MATH470 Independent Study, Undergraduate
Credit may be earned for an independent study during a summer or authorized leave of absence provided that (1) plans have been approved in advance, and (2) all specified requirements have been satisfied.
Offering: Host
Grading: OPT
Credits: 0.50
Gen Ed Area: None
Prereq: None

MATH491 Teaching Apprentice Tutorial
The teaching apprentice program offers undergraduate students the opportunity to assist in teaching a faculty member’s course for academic credit.
Offering: Host
Grading: OPT

MATH492 Teaching Apprentice Tutorial
The teaching apprentice program offers undergraduate students the opportunity to assist in teaching a faculty member’s course for academic credit.
Offering: Host
Grading: OPT

MATH495 Research Apprentice, Undergraduate
Project to be arranged in consultation with the tutor.
Offering: Host
Grading: Cr/U

MATH496 Research Apprentice, Undergraduate
Project to be arranged in consultation with the tutor.
Offering: Host
Grading: Cr/U

MATH500 Graduate Pedagogy
The elements of good teaching will be discussed and demonstrated through lectures, practice teaching sessions, and discussions of problems encountered in the actual teaching environment. The staff consists of faculty and experienced graduate students. An integral part of the course is a required one-day workshop BEFORE the first day of formal classes.
Training in pedagogy in the first semester of attendance is required for all incoming Wesleyan MA and PhD students who have not already fulfilled this requirement at Wesleyan. BA/MA students are not required to get training in pedagogy but may choose to do so.
Offering: Crosslisting
Grading: Cr/U
Credits: 0.50
Gen Ed Area: None
spaces and integrals, product measures, decomposition and differentiation of
topics as Lebesgue measure and integration on the line, abstract measure
complex analysis. One semester will be devoted to real analysis, covering such
MATH513 and MATH514 constitute the first-year graduate course in real and
MATH513 Analysis I
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH514 Analysis I
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH507 Topics in Combinatorics
Each year the topic will change.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH506 Selected Topics, Graduate Sciences
Topic to be arranged in consultation with the tutor.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH505 Group Tutorial, Graduate
Topic to be arranged in consultation with the tutor.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH504 Selected Topics, Graduate Sciences
Topic to be arranged in consultation with the tutor. A seminar primarily
centrated on papers taken from current research publications designed for,
and required of, graduate students.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH503 Selected Topics, Graduate Sciences
Topic to be arranged in consultation with the tutor. A seminar primarily
centrated on papers taken from current research publications designed for,
and required of, graduate students.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH502 Individual Tutorial, Graduate
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH501 Individual Tutorial, Graduate
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH523 Topology I
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH524 Topology I
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH516 Analysis II
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH515 Analysis II
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH514 Analysis I
MATH513 and MATH514 constitute the first-year graduate course in real and
complex analysis. One semester will be devoted to real analysis, covering such
topics as Lebesgue measure and integration on the line, abstract measure
spaces and integrals, product measures, decomposition and differentiation of
measures, and elementary functional analysis. One semester will be devoted
to complex analysis, covering such topics as analytic functions, power series,
Mobius transformations, Cauchy's integral theorem and formula in its general
form, classification of singularities, residues, argument principle, maximum
modulus principle, Schwarz's lemma, and the Riemann mapping theorem.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH513 Analysis I
MATH513 and MATH514 constitute the first-year graduate course in real and
complex analysis. One semester will be devoted to real analysis, covering such
topics as Lebesgue measure and integration on the line, abstract measure
spaces and integrals, product measures, decomposition and differentiation of
measures, and elementary functional analysis. One semester will be devoted
to complex analysis, covering such topics as analytic functions, power series,
Mobius transformations, Cauchy's integral theorem and formula in its general
form, classification of singularities, residues, argument principle, maximum
modulus principle, Schwarz's lemma, and the Riemann mapping theorem.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH523 Topology I
This course is an introduction to topological spaces and the fundamental group;
topological spaces, continuous maps, metric spaces; product and quotient
spaces; compactness, connectedness, and separation axioms; and introduction
to homotopy and the fundamental group.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH524 Topology I
A continuation of MATH523, this course will be an introduction to algebraic
topology, concentrating on the fundamental group and homology.
Prereq: None
Gen Ed Area: None
Credits: 1.00
Grading: A-F
Offering: Host
MATH525 Topology II: Topics in Topology
This is a topics course in topology that varies from year to year. This course may be repeated for credit. Recent topics have included knot theory, homotopy theory, Lie groups, and topological graph theory.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None

MATH526 Topology II
This is a topics course in topology that varies from year to year. It may be repeated for credit.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None

MATH543 Algebra I
This course covers group theory including Sylow theorems, and basic ring and module theory, including structure of finitely generated modules over principal-ideal domains.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None

MATH544 Algebra I
This course studies Galois theory, finitely generated modules over principal-ideal domains, and other topics as time permits.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None

MATH545 Algebra II: Topics in Algebra
This is a topics course in algebra that varies from year to year. This course may be repeated for credit.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None

MATH546 Algebra II
This is a topics course in algebra that varies from year to year. It may be repeated for credit.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None

MATH549 Advanced Research Seminar, Graduate
Advanced research tutorial; project to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

MATH572 Special Topics in Mathematics
This is a supervised reading course on advanced topics in number theory. This course may be repeated for credit.
Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None