MATH

Department of Mathematics
College of Natural Science

103. College Algebra
Fall, Spring, Summer. 3(3-0)
P: MTH 1825 or designated score on mathematics placement test. R: Not open to students with credit in MTH 110 or MTH 116 or MTH 120 or LBS 117.

104. Trigonometry
Fall, Spring, Summer. 3(3-0)
P: MTH 103 or MTH 110 R: Not open to students with credit in MTH 116.
Radian and degree measure of angles. Definitions and graphs of trigonometric functions and their inverses. Solving trigonometric equations. Applications including identities, law of sines, law of cosines, vectors in the plane, and polar coordinates.

110. College Algebra and Finite Mathematics
Fall, Spring, Summer. 5(5-0)
P: MTH 1625 or designated score on mathematics placement test. R: Not open to students with credit in MTH 103 or MTH 116 or MTH 124 or LBS 117.

116. College Algebra and Trigonometry
Fall, Spring, Summer. 5(5-0)
P: MTH 1625 or designated score on mathematics placement test. R: Not open to students with credit in MTH 103 or MTH 116 or MTH 122 or LBS 117.

120. Algebra and a Survey of Calculus
Fall, Spring, Summer. 5(5-0)
P: MTH 1625 or designated score on mathematics placement test. R: Not open to students with credit in MTH 103 or MTH 116 or MTH 123 or LBS 117.

124. Survey of Calculus with Applications I
Fall, Spring, Summer. 3(3-0)
P: Designated score on mathematics placement test or MTH 163. R: Not open to students with credit in MTH 120 or MTH 132 or MTH 152H or LBS 118.
Study of limits, continuous functions, derivatives, integrals, and their applications.

126. Survey of Calculus with Applications II
Fall, Spring, Summer. 3(3-0)
P: MTH 120 or MTH 124. R: Not open to students with credit in MTH 123 or MTH 153H.
Application of partial derivatives, integrals, optimization of functions of several variables and infinite series.

132. Calculus I
Fall, Spring, Summer. 3(3-0)
P: MTH 116 or designated score on mathematics placement test. R: Not open to students with credit in MTH 120 or MTH 124 or MTH 152H or LBS 118.
Limits, continuous functions, derivatives and their applications. Integrals and the fundamental theorem of calculus.

133. Calculus II
Fall, Spring, Summer. 4(4-0)
P: MTH 122 or MTH 152H. R: Not open to students with credit in MTH 126 or MTH 152H or LBS 119 or LBS 119.

152H. Honors Calculus I
Fall, Spring. 3(3-0)
P: MTH 132. R: Honors College student or approval of department.
Not open to students with credit in MTH 136 or MTH 153H.

153H. Honors Calculus II
Fall, Spring. 3(3-0)
P: MTH 149H. R: Honors College student or approval of department.
Not open to students with credit in MTH 153 or MTH 152H.

1825. Intermediate Algebra
Fall, Spring, Summer. 3(3-0)
P: MTH 103.
R: Designated score on mathematics placement test. Not open to students with credit in MTH 120 or MTH 153H or LBS 118.

234. Multivariable Calculus
Fall, Spring, Summer. 4(4-0)
P: MTH 234 or MTH 254H.
R: Not open to students with credit in MTH 235H or MTH 255H.
Vectors in space. Functions of several variables and partial differentiation. Multiple integrals. Line and surface integrals. Green's and Stokes' theorems.

255H. Honors Differential Equations
Spring. 3(3-0)
P: MTH 254H. R: Honors College student or approval of department.
Not open to students with credit in MTH 254.
Topics chosen from separable and exact equations, linear equations and variation of parameters, series solutions, higher order linear equations, Laplace transforms, systems of first order linear equations, nonlinear equations and stability, introduction to partial differential equations.

290. Directed Study
Fall, Spring, Summer. 1 to 4 credits.
A student may earn a maximum of 6 credits in all enrollments for this course.
Faculty directed study of selected mathematical topics.

302. Linear Algebra
Fall, Spring, Summer. 3(3-0)
P: MTH 234 or MTH 254H.
Vectors, matrices, and linear transformations. Operations on matrices. Inner products, dimension, eigenvalues and eigenvectors. Applications to systems of equations and to geometry.

310. Abstract Algebra I and Number Theory
Fall, Spring, Summer. 3(3-0)
P: MTH 234 or MTH 254H.
R: Not open to students with credit in MTH 235H.
A writing course with an emphasis on proofs. Structure of the integers, congruences, polynomial rings, ideals and fields.

A-129
414. Linear Algebra II
Fall, Spring. 3(3-0)
P: MTH 310; MTH 314. R: Not open to students with credit in MTH 415.
Linear transformations on finite dimensional vector spaces. Invariant subspaces, rank, eigenvalues and eigenvectors. Canonical forms. Bilinear and multilinear forms.

415. Applied Linear Algebra
Fall, Spring. 3(3-0)
P: MTH 314. R: Not open to students with credit in MTH 414.

416. Introduction to Algebraic Coding
Fall. 3(3-0)
P: MTH 314.
Concepts and techniques of abstract algebra applied to the design of communication systems for use in imperfect circumstances. Theory of codes designed by algebraic means.

417. Topics in Number Theory
Fall of odd-numbered years. 3(3-0)
P: MTH 316.
Congruences of higher degree, primitive roots and quadratic reciprocity. Number-theoretic functions, algebraic numbers. Dirichlet Series, p-series expansion, continued fractions.

418I. Honors Algebra I
Fall. 3(3-0)
P: MTH 310. R: Completion of Tier I writing requirement. Not open to students with credit in MTH 411.
Theory of groups, Sylow theory, the structure of finite Abelian groups, ring theory, ideals, homomorphisms, and polynomial rings.

418II. Honors Algebra II
Spring. 3(3-0)
P: MTH 418I. R: Not open to students with credit in MTH 412.
Algebraic field extensions, Galois theory. Classification of finite fields. Fundamental Theorem of Algebra.

421. Analysis II
Fall, Spring, Summer. 3(3-0)
P: MTH 310, MTH 320 or MTH 421.

422. Complex Analysis
Fall, Spring. 3(3-0)
P: MTH 320.
Analytic functions of a complex variable: Cauchy integral theorem, conformal maps, bilinear transformation, harmonic functions. Classification of singularities, residues, conformal mappings.

423. Honors Analysis I
Fall. 3(3-0)
P: Honors college students or approval of department. Not open to students with credit in MTH 421.
Honors analysis with emphasis on metric topology, differentiation, and integration in higher dimensional settings. Convergence of sequences of functions.

424I. Honors Analysis II
Spring. 3(3-0)
P: MTH 423I. R: Not open to students with credit in MTH 422.
Continuation of MTH 423I. Convergence of sequences of functions, inverse and implicit function theorems, integration in higher dimensional settings.

425. Metric and Topological Spaces
Fall. 3(3-0)
P: MTH 421.

426. Geometric Topology
Spring. 3(3-0)
P: MTH 421. R: Completion of Tier I writing requirement. A capstone course. Topology of surfaces and higher dimensional manifolds, studied from combinatorial, algebraic or differential viewpoints.

427. Mathematical Logic
Spring. 3(3-0)
P: MTH 410.
Logic and formal systems, syntax and semantics. Completeness and categoricity. Decidable and undecidable theories and Goedel's theorems. Peano arithmetic.

428. Mathematical Logic
Spring. 3(3-0)
P: MTH 411.
Recursion and generating functions, Ramsey theory. Block designs,Latin squares, Eulerian and Hamiltonian paths. Minimum spanning trees, network flows.

429. Directed Studies
Fall, Spring, Summer. 1 to 4 credits.
R: Approval of department. A project under the direction of a faculty member.

430. Capstone in Mathematics
Fall, Spring. 3(3-0)
R: Completion of Tier I writing requirement. Approval of department.
A capstone course integrating several areas of mathematics.

431. Current Issues in Mathematics
Education
Fall. 3(3-0)
R: Approval of department.
Recent developments in K-12 mathematics curriculum, teaching, learning, and evaluation.

432. Critical Content of School Mathematics: Algebra and Analysis
Spring of odd-numbered years. 3(3-0)
P: MTH 310, MTH 320, MTH 381.
Foundations and development, evolution and applications in the school curriculum. Connections among content areas. Learning and teaching mathematics.

433. Critical Content of School Mathematics: Geometry and Discrete Mathematics
Spring of even-numbered years. 3(3-0)
P: MTH 330, MTH 481, MTH 482. R: Open only to graduate students.
Foundations and development, evolution and applications in the school curriculum. Connections among content areas. Learning and teaching mathematics.