

MATH 304 **COLLEGE GEOMETRY (3)** *Prerequisite: MATH 104.* This course covers the important aspects of Euclidean Geometry including topics involving angles, triangles, parallel and perpendicular lines, circles, polygons, similarity, areas, volumes, as well as various selected topics in mathematics from the recommended Standards of the National Council of Teachers of Mathematics (NCTM) and the PRAXIS II exam. It is also intended to give students further exposure to the art of formal proof writing in a setting where many steps of the proof can be displayed and explained visually.

MATH 307 **LINEAR ALGEBRA (3)** *Strongly recommended: MATH 260* This course provides a study of linear transformations over vector spaces covering vectors, vector spaces, matrices, determinants, systems of linear equations, and linear transformations.

MATH 311 **PROBABILITY THEORY (3)** *Prerequisite: MATH 104.* This course introduces mathematical probability theory using an axiomatic approach and considering numerous applications.

MATH 313 **COMPLEX VARIABLES (3)** *Prerequisite: MATH 211.* This course examines properties of complex numbers; elementary functions of a complex variable; complex derivatives and analytic functions; mappings; definite and indefinite integrals; Cauchy's theorem and integral formulas; Taylor and Laurent expansions; singular points and the residue theorem; conformal mapping with applications.

MATH 323 **NUMBER THEORY (3)** *Prerequisite: MATH 260 or consent of instructor.* This course deals with the properties of the set of integers. Topics considered include divisibility and division algorithm, congruences, quadratic residues, recurrence functions, diophantine equations, and continued fractions.

MATH 328 **VECTOR ANALYSIS (3)** *Strongly recommended: MATH 211.* This course includes vector algebra; vector geometry; vector functions; vector calculus: derivatives, gradient, curl, divergence, and Laplacian operators; line and surface integrals; Stokes' and Gauss' theorems; applications to physics; generalized coordinates; linear vector spaces.

MATH 333 **MATHEMATICAL STATISTICS (3)** *Prerequisite: MATH 104 and MATH 311.* This course provides a theoretical background and an introduction to statistics by examining the topics of graphical displays and statistical measures, random samples, sampling distributions, expected value, the Central Limit Theorem, properties of the methods to determine point estimates, probability distributions (e.g., normal, t, F, Chi-squared), confidence intervals, hypothesis testing, Type I and II errors, the power of tests, determining sample sizes, correlation, simple and multiple linear regression and analysis of variance.

MATH 399 **INTERNSHIP IN MATHEMATICS (1-3)** *Prerequisites: Juniors or seniors with a 2.25 minimum QPA; approval of written proposal by internship coordinator; and supervising faculty prior to registration.* Students may earn college credit for participation in an internship with a business firm or agency, jointly supervised by the program and the responsible organization administrator. The internship is expected to provide the student with an opportunity to apply, in a practical way, some of the mathematical skills acquired. (See "Internships.")

MATH 405-406 **ABSTRACT ALGEBRA (3, 3)** *Prerequisite: MATH 260* Three hours lecture each semester. This course sequence introduces students to algebraic concepts such as groups, rings, integral domains, and fields. The elementary number systems occupy a central place. Mappings, especially homomorphisms, are introduced fairly early and emphasized throughout.

MATH 407-408 **ADVANCED CALCULUS (3, 3)** *Prerequisite: MATH 260* Three hours lecture each semester. This sequence introduces students to the foundations of analysis including a study of limits and continuity, functions of several variables, and finite and infinite series.

MATH 409 **NUMERICAL ANALYSIS (3)** *Prerequisite: MATH 211.* This course examines some commonly used numerical methods for the solutions of linear and non-linear equations and systems; difference calculus and interpolation; numerical differentiation and integration.

MATH 420 **TOPOLOGY (3)** *Prerequisites: MATH 260.* This course explores basic concepts of a topological space; continuous functions and mappings; separation axioms; metric spaces; deformations; and topology of plane sets.

MATH 440

TOPICS IN MATHEMATICS (3) *Prerequisites: Senior standing and a minimum of nine hours of advanced mathematics, as well as consent of the instructor and advisor.* This course is designed for those students who desire work not offered in the regular advanced courses in mathematics and who wish to work on an individual project under the supervision of a mathematics professor.

MATH 451

SENIOR PROJECT (3) *Prerequisites: Senior standing and at least three mathematics courses numbered 300 or higher.* This course serves as a capstone for those students with a major in mathematics. The student does an intensive study of a mathematics topic of his/ her choice under a supervising professor. This study must involve a synthesis of available material on the topic including (but not limited to): traditional books, journal articles, and web-based materials. The student must write a research paper on the topic and present it to a faculty committee.