264. Differential Equations (Akinyemi, Zhou)
An introductory course in ordinary differential equations including techniques of elementary linear algebra. Emphasis is on first-order equations, higher-order linear equations, and systems of equations. Topics include qualitative analysis of differential equations, analytical and numerical solutions, Laplace transforms, existence and uniqueness of solutions, and elemental models in science and engineering. Prerequisite: Mathematics 263.

272. Linear Algebra with Applications (Grodzicki)
An introductory course in linear algebra emphasizing applications to fields such as economics, natural sciences, computer science, statistics, and engineering. The course covers solutions of systems of equations, matrix algebra, vector spaces, linear transformations, determinants, eigenvalues, and eigenvectors. Corequisite: Mathematics 263 or permission of instructor.

287. Introduction to Data Modeling (Gaugler)
This course will examine advanced methods for analyzing data. Topics will include experimental design concepts, one- and two-way ANOVA (and interaction), multiple regression and ANCOVA, analysis of categorical outcomes (including logistic regression), and power. Time permitting, additional topics may be covered. The course emphasizes the correct application and interpretation of these methods, including assessment of underlying assumptions. Applications will require use of statistical software (presumably R), which is left to the discretion of the instructor.

290. Transition to Theoretical Math (Bloom)
An introduction to the concepts and techniques that permeate advanced mathematics. Topics include set theory, propositional logic, proof techniques, relations, and functions. Special emphasis on developing students' facility for reading and writing mathematical proofs. Examples and additional topics are included from various branches of mathematics, at the discretion of the instructor. Corequisite: Mathematics 263 or permission of instructor.

301. Case Studies in Mathematical Modeling (Storey)
A course which engages students in the creation of mathematical models to answer questions about a variety of phenomena. Students work in small teams on a sequence of projects which require the formulation, analysis, and critical evaluation of a mathematical model and conclude with the submission of a written report by each student. Prerequisite: Mathematics 272 or 300 and 282.

323. Geometry (Corvino)
Various geometries are considered including absolute, Euclidean, and the classical non-Euclidean geometries. General properties of axiomatic systems, models, and the role of Euclidean geometry in the development of other branches of mathematics are discussed. Prerequisite: Mathematics 162 or permission of instructor. Corequisite: Mathematics 263 or permission of instructor; reading and writing proofs will be a significant part of the course, so MATH 290 could be useful, though it is not a prerequisite.

335. Probability (Fisher)
A development of basic probability theory including the axioms, random variables, expected value, the law of large numbers, and the central limit theorem. Additional topics include distribution functions and generating functions. Prerequisite: Mathematics 263.

336. Mathematical Statistics (Xu)
A mathematical development of fundamental results and techniques in statistics. Topics include estimation, sampling distributions, hypothesis testing, correlation and regression. Prerequisite: Mathematics 335.

345. Complex Analysis (Gomez-Lopez)
An introductory course in the calculus of complex functions including the algebra and geometry of complex numbers, elementary mappings, complex derivatives and integrals, Cauchy-Riemann equations, harmonic functions, Cauchy's Integral Theory, Taylor and Laurent series, residues. Prerequisite: Mathematics 263.

+A wide range of topics in mathematical finance are covered, including: continuous time models such as the Brownian motion model for stock prices, the Black-Scholes model for options prices, the Ho-Lee, Vasicek and other models for interest rates; also different hedging strategies and numerical approaches for derivative pricing such as binomial trees, Monte-Carlo simulation and finite difference methods, and price models for credit derivatives such as asset swaps, credit default swaps and collateralized debt obligations. Prerequisite: Economics 101, Mathematics 335.