

2015-2016 Mathematics Course Descriptions

MTH 100 Intermediate Algebra. A study of the real number system, linear equations and inequalities, and systems of linear equations and inequalities intended to better prepare the student for higher levels of mathematics. May not be taken after credit is granted for MTH 105 or above except for change of grade. 2 Semester Hours.

MTH 105 College Algebra. A study of exponents and polynomials, factoring, rational expressions, and quadratic equations intended to better prepare the student for higher levels of mathematics. May not be taken after credit is granted for MTH 140 or above except for change of grade. Prerequisite: satisfactory score on the mathematics placement exam or MTH 100. 2 Semester Hours.

MTH 121 Data Analysis. A study of graphical and numerical methods for describing data, counting methods, probability, distributions of data, and data interpretation. Prerequisite: satisfactory score on the mathematics placement exam or MTH 100. May not be taken after credit is granted for MTH 123 or above, except for change of grade. 2 Semester Hours.

MTH 123 Elementary Statistics. A study of measures useful in giving concise descriptions of masses of numerical data. A brief study of probability theory provides the basis for an introduction to methods of testing hypotheses and measuring the confidence with which conclusions may be drawn by sampling. Historical developments of statistics and probability will be explored as will applications in various fields. Prerequisites: MTH 105 or a satisfactory score on the math placement examination. 4 Semester Hours.

MTH 125 Elementary Discrete Mathematics. An introduction to discrete mathematics. Topics include logic and proof, sequences and sets, recurrence relations, elementary probability, functions, mathematical induction, recurrence relations, graphs and trees, and matrix manipulation. Prerequisite: MTH 105 or a satisfactory score on the mathematics placement examination. 4 Semester Hours.

MTH 140 Precalculus Mathematics. A study of topics needed to prepare a student for calculus including polynomial, exponential, and logarithmic functions, graphs, quadratic equations and inequalities, and selected topics from analytic geometry and trigonometry. May not be taken after credit is granted for MTH 141 except for change of grade. Prerequisite: MTH 105, which may be taken concurrently, or a satisfactory score on the mathematics placement examination. 4 Semester Hours.

MTH 141 Calculus I. A study of limits, continuity, differentiation, and an introduction to the indefinite and definite integrals. Includes applications to optimization problems, related rates and the Fundamental Theorem of Calculus. May not be taken after credit is granted for MTH 142 except for change of grade. Prerequisites: MTH 140 with a grade of C- or higher, or a satisfactory score on the math placement examination. 4 Semester Hours.

MTH 142 Calculus II. A continued study of techniques and applications of integration and study of the calculus of infinite series, polar coordinates and parametric equations. Also includes an introduction to differential equations. Prerequisite: MTH 141 with a grade of C- or higher. 4 Semester Hours.

MTH 200 Statistics for the Health Sciences. The course provides an introduction to the concepts of statistical analysis and statistical reasoning, specifically geared toward health science data. The main topics covered are sampling, experimental design, data summaries, probability, and basic methods of inference. An emphasis will be placed on reading and understanding experimental design and statistical decisions in the healthcare setting. Prerequisites: MTH 105 or a satisfactory score on the math placement examination. 4 Semester Hours.

MTH 222 History of Math. A survey of the history of mathematics from antiquity through the present time. Contributions by various individuals and cultures will be examined. Both European and non-European mathematical developments will be explored, with an emphasis on the interrelationship between mathematics and the culture of the time. Prerequisite: MTH 141. 2 Semester Hours.

MTH 241 Calculus III. A study of vectors and vector analysis, functions of two or more variables, partial derivatives, multiple integrals, line and surface integrals, and Green's Theorem. Prerequisite: MTH 142. 4 Semester Hours.

MTH 300 College Geometry. An informal introduction to the concepts and principles of Euclidean geometry in two and three dimensions. Geometric software will be used to explore geometric ideas and their applications in real-world contexts. Typically offered in the fall semester of even-numbered years. Prerequisite: MTH 142. 2 Semester Hours.

MTH 301 Introduction of Advanced Mathematics and Number Theory. A study of selected topics intended to introduce the student to abstract mathematics. Topics include the language of sets and functions and methods of proof, as well as selected topics from number theory including the Euclidean Algorithm and congruences. Prerequisite: MTH 142. 4 Semester Hours.

MTH 305 Introduction to Probability and Statistics for Engineering. This course provides an introduction to the use of probability and statistics in engineering. Topics include descriptive statistics, simple regression, probability, continuous probability distributions, point estimation, confidence intervals, hypothesis tests, and risk assessment. Prerequisite: MTH 142. 2 Semester Hours.

MTH 306 Probability and Statistics for Engineering and Science. This course provides the theory and practice of the use of probability and statistics in engineering and science. Topics include descriptive statistics, probability, discrete and continuous probability distributions, estimation and confidence intervals, hypothesis tests, risk assessment, Monte Carlo methods, correlation and regression, analysis of variance, and design of experiments. An applied group project is required in which experimental design, data collection, and computer analysis of data are utilized. Prerequisite: MTH 142. 4 Semester Hours.

MTH 333 Linear Algebra and Differential Equations. An introduction to the principal ideas and methods in linear algebra and differential equations. Some of the topics include systems of linear equations, matrices and determinants, vector spaces, eigenvalues and eigenvectors, linear differential equations, system of differential equations, and applications. Prerequisite: MTH 142. 4 Semester Hours.

MTH 341 Advanced Calculus. A rigorous study of the basic concepts and history of calculus including the formal definitions and theorems of limits, the derivative, and the Riemann integral. Prerequisite: MTH 301. 2 Semester Hours.

MTH 351 Numerical Analysis. A study of numerical integration and the numerical solution of differential equations, numerical methods of linear algebra, matrix inversion and the solving for real roots of equations. Oriented toward computation using computers. Typically offered in the fall semester of even-numbered years. Prerequisites: MTH 333. A computer programming course such as CSC 220 is recommended. 2 Semester Hours.

MTH 362 Discrete Mathematics. A study of the basic elements and history of discrete mathematics such as graph theory, recurrence relations, finite difference approaches, linear programming, and combinatorics. Prerequisite: MTH 142. 2 Semester Hours.

MTH 395 The Teaching of Mathematics. A mathematical methods course for students who are preparing to teach in adolescence to young adult or middle school programs. Content includes: theories, models and strategies for teaching diverse learners, planning instruction, creating effective learning environments and collaboration with parents and other professionals. Emphasis is placed on helping the student to develop the professional knowledge base necessary for success in accordance with the requirements of State and other educational agencies. Twenty clock hours of fieldwork in a secondary school are required. Prerequisites: MTH 142 and permission of the instructor. 4 Semester Hours.

MTH 401 Topics in Pure Mathematics. The content of this course will come from the general areas of algebra, topology, real and complex analysis, or number theory. This course can be repeated for additional credit hours. Prerequisite: Junior or Senior standing and MTH 301. 2 or 4 Semester Hours.

MTH 405 Mathematical Statistics I. An introduction to statistics making use of calculus. Topics include historical developments of statistics, probability theory, discrete random variables, and continuous random variables. Prerequisites: MTH 123 and MTH 142. 2 Semester Hours.

MTH 406 Mathematical Statistics II. A continuation of MTH 405. Topics include multivariate probability distributions, functions of random variables, sampling theory, estimation, hypothesis testing, linear models, and ANOVA. Prerequisite: MTH 241 and MTH 405. 4 Semester Hours.

MTH 411 Abstract Algebra. A study of the basic properties of groups and rings. The axiomatic approach is emphasized. Prerequisites: MTH 241, MTH 301, and MTH 333. 4 Semester Hours.

MTH 460 Senior Seminar. This course will be taken with one of the following topics of emphasis: Mathematics Education, Pure Mathematics, Applied Mathematics, Statistics, or Financial Mathematics. This course is required of all mathematics and financial mathematics majors. This course has as its requirements the completion of a senior research project which will be communicated to the department in either a poster or a presentation, and a research paper. A total of two credits must be completed in one or both semesters of the senior year. Prerequisites: Mathematics or financial mathematics major with senior standing, or permission of the instructor. 1-2 Semester Hours.