

MATHEMATICS (MATH)

MATH-104 Math for Liberal Arts 3 Credits

A non-technical course emphasizing the ideas and concepts of mathematics. Algebra, number theory, set theory, geometry, statistics, probability, and analysis of the ideas and methods involved.

MATH-105 Essential Mathematics 4 Credits

This course prepares students to understand the essential mathematical concepts in number sense, elementary algebra, sets of numbers, problem solving, ratios, proportions, percentages, and graphing linear equations and inequalities. The course is designed to introduce students to practical mathematical skills necessary for courses in business and statistics. Emphasis will be placed on the structural and logical foundations of business. (Meets Elective requirement only; not applicable to Natural Science/Math requirement). (Professional Education course).

MATH-106 Business Math 3 Credits

This course applies the principles and practices of mathematics to everyday business problems and situations. The course prepares students to understand the mathematical and business concepts in problem solving, ratios and proportions, percentages, simple and compound interest, graphing linear functions, and inventory valuation. The course introduces students to common mathematical skills necessary for courses in business. (Meets Natural Science/Math requirement). (Professional Education Course).

MATH-109 Mathematics for Statistics 4 Credits

This course prepares students to understand the mathematical and statistical concepts in problem solving, critical thinking, ratios and proportions, algebraic equations, sets and logic, probability and statistics, including frequency of distribution, statistical graphs, measures of central tendency, and measure of position and dispersion. The course introduces students to common mathematical skills necessary for coursework in statistics. (Meets Natural Science/Math requirement). (Professional Education Course).

MATH-115C Applied Mathematics and Personal Finance 3 Credits

This course introduces the use of mathematics as a logically thinking and problem-solving tool of practical applications, emphasizing inductive and deductive reasoning, graphs, tables, percentage as it applies to loans, mortgages, credit cards, etc., probability, statistics, and the use and misuse of numbers. Applications include variables, conditionals, and statistical functions. Fulfills the core curriculum requirement in mathematics.

Terms Typically Offered: Fall and Spring.

MATH-116C College Algebra 3 Credits

Sets and real numbers, linear equations and inequalities, polynomials, functions, graphing linear and polynomial functions, exponential and logarithmic functions, systems of equations, matrices and determinants, sequences and series. Fulfills the Math CORE requirement.

MATH-120 Math for Elementary Teachers 3 Credits

Introductory set theory, problem solving, basic algorithms, elementary number theory, geometry and coordinate geometry. Emphasis will be on the structural and logical foundations of mathematics.

Prerequisite: MATH-115C, MATH-170C, or MATH-180C

Terms Typically Offered: Fall and Spring.

MATH-121 Teaching Math Concepts for K-8 Educators 3 Credits

This undergraduate course equips future educators with the essential skills to impart mathematical concepts effectively to elementary and middle school students. Participants will delve into innovative teaching methods and strategies tailored to the diverse learning needs of K-8 students, fostering a deep understanding of foundational mathematical principles. Through hands-on activities and collaborative projects, students will gain practical experience in designing engaging lesson plans that promote critical thinking and problem-solving skills. The course emphasizes the use of technology and manipulatives to enhance mathematical learning experiences, preparing educators to create dynamic and interactive classroom environments. By the end of the course, participants will have the knowledge and confidence to inspire a love for mathematics in their students, laying the groundwork for future academic success.

Prerequisite: MATH-115C, MATH-170C, or MATH-180C

Terms Typically Offered: Fall, Spring, and Summer.

MATH-170C Precalculus 3 Credits

Equations and inequalities; systems of linear equations: functions, graphs, exponential, logarithmic, and trigonometric functions and their limits; polynomial and rational functions; analytic geometry. Fulfills the core curriculum requirement in mathematics.

Terms Typically Offered: Fall and Spring.

MATH-180C Calculus I 4 Credits

Graphing of functions, logarithmic functions and their inverses; limit of functions and derivatives; rules of differentiation and their application; definite and indefinite integrals. Fulfills the core curriculum requirement in mathematics.

Prerequisite: MATH-170C or Permission of Instructor

Terms Typically Offered: Fall and Spring.

MATH-181C Calculus II 4 Credits

Application of integration for volumes, work and areas; advanced techniques of integration; advanced application of integration; first order differential equations; parametric equations and polar coordinates; infinite sequences and series.

Prerequisite: MATH-180C

Terms Typically Offered: Fall and Spring.

MATH-235 Statistics for Health Professionals 3 Credits

Limited to those enrolled in Health Sciences. Meets statistics prerequisite for NURS 405. This course introduces the conceptual background of statistical techniques and reasoning with an emphasis on application relevant to identifying outcomes. Provides a framework for understanding and applying commonly used data analysis techniques in health science research. Includes selecting, applying, and interpreting univariate and bivariate statistical methods in answering research questions from a health science perspective. (Professional Education Course).



MATH-265C Intro to Statistical Methods 3 Credits

This course is cross listed with PSYC-265C and SOC-265C. A course in basic statistical concepts and methods of collecting, summarizing, presenting, and interpreting data in the behavioral sciences; including descriptive statistics (use of graphs and charts), normal distribution curve, measures of central tendency, deviation and dispersion, hypothesis testing, statistical fallacies, correlation, and topics in probability. Students majoring in Accounting, Anthropology, Psychology, or Sociology must take MATH-265C, PSYC-265C, or SOC-265C to fulfill the core curriculum requirement in mathematics. Fulfills the core curriculum requirement in mathematics for students majoring in Accounting, Anthropology, Psychology, or Sociology.

Terms Typically Offered: Fall and Spring.

MATH-270C Health Professions Statistical Methods 3 Credits

Meets statistics pre-requisite for NURS-405. The focus of this course is on exploring the statistical methods used in health professions. Students review parametric and nonparametric techniques and explore the purpose, assumptions, selection, and interpretation of descriptive and inferential statistics. As part of the course, students use Microsoft Excel to organize and analyze data sets. Open to all undergraduate health science students.

Terms Typically Offered: Fall and Spring.

MATH-281 Multivariable Calculus 4 Credits

Vectors and geometry of space including cylindrical and spherical coordinates; vector functions and space curves with vector calculus, partial derivatives with directional derivatives and applications; multiple integrals with various coordinate systems with application.

Prerequisite: MATH-181C

MATH-285 Introduction to Advanced Mathematics 3 Credits

A course for both mathematics and mathematics education majors. Covers the fundamentals of axiomatic proof theory including laws of inference, set theory, induction, cardinality, relations and functions.

Prerequisite: MATH-180C

Terms Typically Offered: Spring.

MATH-293 Special Topic: 3 Credits

Study of a special topic in mathematics. May be repeated for credit.

MATH-294 Sp Top: Into to Comp Science 4 Credits

Study of a special topic in mathematics. May be repeated for credit.

MATH-300 Linear Algebra 3 Credits

Systems of linear equations, vector spaces, linear mappings, matrices and matrix algebra, eigenvectors and eigenvalues, Cayley-Hamilton theorem, quadratic forms, and applications.

Prerequisite: MATH-285

Terms Typically Offered: Fall.

MATH-310 Differential Equations 3 Credits

Methods of solution of ordinary differential equations and applications.

Prerequisite: MATH-281, MATH-300

Terms Typically Offered: Spring.

MATH-315 Teaching/Tutoring 3 Credits

Students seeking to complete the Single Subject Matter Program in English must take this course as part of that program to ensure they are integrating literary content with their pedagogical experience. This course provides the philosophical background and classroom experience necessary to introduce the student to the teaching profession in a public or private school in a multicultural environment. The purpose of the class is to assist the student in gaining an understanding of the resources and challenges facing a teacher serving a linguistically and culturally diverse student population. Discussion focuses on the major professional organizations and educational research related to the philosophical, historical, and demographic developments of American education. Students complete a 30-hour field work component to observe classroom management and organization, Specially Designed Academic Instruction Delivered in English (SDAIE) instructional practices, and the curricula of grades K-12. The role and function of Christian beliefs and values in the public school are integrated throughout the course. This course is a prerequisite requirement for Multiple and Single Subject Credential programs. Lab fee.

MATH-330 Number Theory 3 Credits

Divisibility properties of integers, prime numbers, the Euclidean algorithm, the unique factorization theorem, congruences, Fermat's theorem, Wilson's theorem, Diophantine equations, number-theoretic functions, and the quadratic reciprocity theorem.

Prerequisite: MATH-285

Terms Typically Offered: Spring, even years.

MATH-365 Probability and Statistics 3 Credits

Frequency interpretation of probability, axioms of probability theory, discrete probability and combinatorics, random variables, distribution and density functions, sampling theory and limit theorems.

Prerequisite: MATH-281, MATH-285

MATH-370 History of Mathematics 3 Credits

An introduction to the history of mathematics from ancient times to the twentieth century, with applications to elementary mathematics through calculus.

Prerequisite: MATH-180C

Terms Typically Offered: Fall, even years.

MATH-375 Discrete Mathematics 3 Credits

This course is designed to study graph theory including networks, voting systems including game theory and fair apportionment, and patterns.

Prerequisite: MATH-181C, MATH-285

Terms Typically Offered: Fall, odd years.

MATH-380 Elementary Analysis I 3 Credits

Rigorous analysis of the calculus and its foundations. Continuous and differentiable functions, and topological properties of the real number line.

Prerequisite: MATH-281, MATH-285

Terms Typically Offered: Spring, even years.

MATH-390 Numerical Analysis 3 Credits

Numerical solution of algebraic equations. Approximate numerical solutions of systems of linear and nonlinear equations, interpolation theory, numerical differentiation and integration, and numerical solution of ordinary differential equations.

Prerequisite: ENGR-307 and MATH-181C

Terms Typically Offered: Spring, even years.

MATH-400 Casualty & Actuarial Mathematics 3 Credits

The course covers concepts from calculus and probability as they pertain to actuarial sciences. The calculus part covers limits of functions, derivative and integration and their applications, power series and polar coordinates, multivariate differentiation and integration. The probability part covers basic concepts of probability, conditional probability and Bayes' theorem, discrete and continuous random variables and distributions, bivariate distributions, conditional expectation and variance, transformations of random variables and moment generating function. The pace will be fast and the stress will be on the SOA/CAS Course 1 exam-type of word problems.

Prerequisite: MATH-281 and MATH-365

Terms Typically Offered: Spring, even years.

MATH-410 Abstract Algebra 3 Credits

Recommended MATH-310 and MATH-330. Group theory centered on group isomorphisms and homomorphisms. Symmetry, Burnside's Lemma, Group Actions, and the Sylow Theorems. Lattices and Boolean algebras. An introduction to rings and fields, especially polynomial rings, splitting fields, and extension fields.

Prerequisite: MATH-285, MATH-310

Terms Typically Offered: Fall, even years.

MATH-420 Higher Geometry 3 Credits

Euclidean geometry from an advanced standpoint, and topics in non-Euclidean geometry.

Prerequisite: MATH-285

Terms Typically Offered: Spring, odd years.

MATH-450 UG Research and Internship Program 1-4 Credits

This course may be taken for a maximum of four (4) units in one semester. A maximum of six (6) combined unit credits for MATH-450, DSCI-450, CSCI 450, DSCI-485 and CSCI-485 apply to graduation. This course is designed with the purpose of providing students the opportunity to apprentice with actuarial companies in the community. This course promotes early entry into the workplace for the student through part-time employment. This course requires actual work experience be sought in an appropriate business firm providing an opportunity to integrate classroom teaching in practical application under the direct supervision of the assigned instructor. Students are responsible for completing a project report and presenting their work experience in MATH-499C."

Terms Typically Offered: On Demand.

MATH-455 Mathematics Teaching Internship 1-3 Credits

Must have the consent of the instructor and department chair. Regular hours each week for classes and/or meetings are established at the beginning of the semester with the supervising instructor. The intern assists an instructor in planning and conducting a course and/or laboratory session. This course may be taken for 1-3 units per semester. May be repeated for a maximum of six units.

Terms Typically Offered: Fall and Spring.

MATH-485 Undergraduate Mathematics Research 2 Credits

This course provides the student with a research experience in mathematics. Emphasis will be placed on project management, professional proofs, computer-aided mathematical exploration, and research documentation skills. This course is a variable credit course. Two units are recommended for all mathematics majors intending to attend graduate school. It is expected that a research report be completed at the conclusion of the research project and an oral presentation of the results be given in MATH-499C. This course may be repeated for credit."

Prerequisite: MATH-285

Terms Typically Offered: Summer.

MATH-488 Senior Project 2 Credits

An advanced course providing the opportunity for a student to create a novel and independent intellectual work by comparing, contrasting and synthesizing recent research and his/her cumulative knowledge and understanding in mathematics. The precise nature, scope and format of the project must be developed and approved under the guidance of the instructor and in collaboration with the student's academic advisor. Senior projects are typically initiated in the Fall. The project results must also be presented in MATH-499C

Prerequisite: MATH-285

Terms Typically Offered: Fall.

MATH-499C Mathematics Capstone 2 Credits

This course includes analysis and evaluation of current research in mathematics and the integration of faith and learning in mathematics. An oral presentation of research from MATH 485 or 488 is required. In-class presentations by faculty and guests are a part of the course. This course fulfills the Core Curriculum Capstone requirement for Mathematics majors

Terms Typically Offered: Spring.

