

MATHEMATICS (MAT)

- 090. Developmental Mathematics.** 3 hrs. Basic arithmetic skills review and strong concentration on beginning algebra; open only to Development Educational Program students
- 099. Intermediate Algebra.** 3 hrs. Required of all entering freshmen with a substandard ACT mathematics score; does not satisfy any university core or degree requirements; meets 250 contact minutes per week; arithmetic operations review, basic operations on polynomials, solving linear and quadratic equations and graphing linear and quadratic functions (CC 1233)
- 101. College Algebra.** 3 hrs. Prerequisite: Math ACT ≥ 20 or a grade of C or better in MAT 099. Functions and graphs, linear equations and inequalities, non-linear equations, including exponential and logarithmic equations (CC 1313)
- 101E. Explorations in College Algebra.** 3 hrs. Prerequisite: Math ACT ≥ 20 or a grade of C or better in MAT 099. Functions and graphs, linear equations and inequalities, non-linear equations, including exponential and logarithmic equations; taught using technology and group projects (CC 1313)
- 102. Brief Applied Calculus.** 3 hrs. Prerequisite: Math ACT ≥ 24 or a grade of C or better in MAT 101. An introduction to differential and integral calculus with applications primarily related to business and finance (CC 1333, 1423, 1513)
- 103. Plane Trigonometry.** 3 hrs. Prerequisite: Math ACT ≥ 24 or a grade of C or better in MAT 101. Trigonometric functions and their inverses, trigonometric identities and equations, and solutions of triangles (CC 1323)
- 128. Precalculus Mathematics.** 3 hrs. Prerequisite: Math ACT ≥ 24 or a grade of C or better in MAT 101. Functions, analytic geometry, roots of polynomials and basic concepts of trigonometry
- 136. Applied Calculus for Engineering Technology I.** 3 hrs. Prerequisite: Math ACT ≥ 24 or a grade of C or better in MAT 103. Plane analytic geometry, differentiation and integration with applications to curvilinear motion, related rates, curve sketching and areas (A student who receives credit for any other calculus course cannot use this course to satisfy any degree requirements in the College of Science and Technology.)
- 137. Applied Calculus for Engineering Technology II.** 3 hrs. Prerequisite: MAT 136. Continuation of techniques of differentiation and integration. Areas, volumes, centroids, moments of inertia and an introduction to first and second order differential equations (A student who receives credit for MAT 168 or 169 cannot use this course to satisfy any degree requirements in the College of Science and Technology.)
- 167. Calculus I with Analytic Geometry.** 3 hrs. Prerequisite: Math ACT ≥ 26 or a grade of C or better in MAT 103 or MAT 128. Limits, continuity, derivatives and their applications including curve sketching and optimization (CC 1613)
- 168. Calculus II with Analytic Geometry.** 3 hrs. Prerequisite: MAT 167. Definite and indefinite integrals, integration techniques, application of integrals, improper integrals and L'Hopital's rule (CC 1623)
- 169. Calculus III with Analytic Geometry.** 3 hrs. Prerequisite: MAT 168. Sequences, series including Taylor series and power series, parametric equations and polar coordinates in calculus, vectors and the geometry of space (CC 2613)
- 210. Mathematics for Elementary Teachers I.** 3 hrs. Prerequisite: MAT 101. Problem solving, sets, whole numbers and whole numbers operations, number systems and operations including different bases and contributions from diverse cultures, number theory, integers and integer operations (Open only to elementary and special education majors.) (CC 1723)
- 220. Explorations in the Mathematics Classroom.** 1 hr. Ten hours of secondary classroom observations together with five hours of seminar under the direction of a mathematics faculty member
- 280. Multivariable Calculus.** 3 hrs. Prerequisite: MAT 169. Calculus of vector valued functions including tangent and normal vectors, partial derivatives and applications, multiple integrals and applications (CC 2623)
- 285. Introduction to Differential Equations I.** 3 hrs. Prerequisite: MAT 168. Linear ordinary differential equations with applications, and Laplace transforms
- 305. Mathematical Computing I.** 3 hrs. Prerequisite: MAT 280. Introduction to a computer algebra system using calculus-based projects; students will solve mathematical problems in the MAPLE environment that require an understanding of calculus concepts
- 308. Mathematics for Early Childhood Education.** 3 hrs. Prerequisite: MAT 210. Problem solving, ordering, comparing, classifying, numberless, money, time, measurement and geometry (Open only to elementary and special education majors.)
- 309. Mathematics for Elementary Teachers II.** 3 hrs. Prerequisite: MAT 210. Problem solving, rational numbers and rational number operations, real numbers, ratios, proportions, percents, statistics and probability (Open only to elementary and special education majors and mathematics licensure majors.)
- 310. Mathematics for Elementary Teachers III.** 3 hrs. Prerequisite: MAT 210. Problem solving, logic, basic concepts of 2-dimensional and 3-dimensional geometry, congruence and similarity of triangles and measurement (Open only to elementary and special education majors.)
- 314. Calculus for the Arts and Sciences.** 3 hrs. Prerequisite: Math ACT ≥ 24 or a grade of C or better in MAT 103. An introduction to functions, graphs, continuity, differential and integral calculus, with applications to the arts and life sciences (A student who receives credit for any other calculus course cannot use this course to satisfy any degree requirements in the College of Science and Technology.)
- 320. Probability and Mathematical Statistics I.** 3 hrs. Prerequisite: MAT 169, 326, and 340. Discrete distributions, random variables, independence, moment generating functions, continuous distributions and multivariate distributions
- 326. Linear Algebra I.** 3 hrs. Vector spaces, systems of linear equations, linear transformations, matrices and inner products
- 340. Discrete Mathematics.** 3 hrs. Logic, set theory and selected topics from algebra, combinatorics and graph theory
- 370. Introductory Geometry.** 3 hrs. Prerequisite: MAT 326 and 340. Concepts and principles of Euclidean and non-Euclidean geometries in two and three dimensions, axiomatics and proof, coordinate geometry and vectors, congruence and similarity, transformations, concepts and formulas related to two and three-dimensional space. Reasoning and proof, communication, problem solving, connections, representations, and interactive geometry software are integrated throughout the course (Open only to those students preparing to teach mathematics in grades 7-12.)
- 410. Mathematics for Teachers of Junior High School Mathematics.** 3 hrs. The real number system and major subsystems, modular arithmetic, patterns, relations and functions, algebraic expressions and equations, counting techniques and probability; selected topics in geometry including coordinate geometry and transformations (Open only to elementary and special education majors.)
- 415. Introduction to Differential Equations II.** 3 hrs. Prerequisite: MAT 285, 326, and 340. Systems of linear differential equations, operator methods, approximating solutions, Laplace transforms and power series
- 417. Introduction to Partial Differential Equations.** 3 hrs. Prerequisite: MAT 285, 326, and 340. Integrability conditions, quasilinear equations, applications of physics, classification of second order equations and canonical forms, and separation of variables
- 418. Linear Programming.** 3 hrs. Prerequisite: MAT 326 and 340. Convex sets, linear inequalities, extreme-point solutions, simplex procedure and applications
- 419. Optimization in Mathematical Programming.** 3 hrs. Prerequisites: MAT 280 and 418. Selected topics in optimization from linear and nonlinear programming

- 420. Probability and Mathematical Statistics II.** 3 hrs. Prerequisites: MAT 320. Central limit theorem, estimation and hypothesis tests
- 421. Number Theory.** 3 hrs. Prerequisite: MAT 326 and 340. Induction, well-ordering, division algorithm, Euclidean algorithm, Fundamental Theorem of Arithmetic, number theoretic functions and congruences
- 423. Modern Algebra I.** 3 hrs. Prerequisite: MAT 326 and 340. Elementary notions in groups, Fundamental Theorem of Finitely Generated Groups, permutation groups, quotient groups, isomorphism theorems and applications of transformation groups
- 424. Modern Algebra II.** 3 hrs. Prerequisite: MAT 423. Survey of standard algebraic systems; rings, integral domains, fields, modules, polynomial rings and fields of quotients
- 426. Linear Algebra II.** 3 hrs. Prerequisite: MAT 326 and 340. Determinants; polynomials; complex numbers; single linear transformations; orthogonal, unitary and symmetric linear transformations
- 430. Advanced Engineering Mathematics I.** 3 hrs. Prerequisites: MAT 280 and 285. Introduction to Laplace transforms and Fourier series with emphasis on solving ordinary and simple partial differential equations (Does not count as an upper-level mathematics elective.)
- 431. Advanced Engineering Mathematics II.** 3 hrs. Prerequisite: MAT 430. Vector calculus and an introduction to complex variables with emphasis on integral theorems and integration (Does not count as an upper-level mathematics elective.)
- 436. Theory of Functions of a Complex Variable.** 3 hrs. Prerequisite: MAT 280, 326, and 340. Complex numbers and functions, limits, continuity, differentiation, analytic functions, branches, contour integration, and series
- 437. Graph Theory.** 3 hrs. Prerequisite: MAT 326 and 340. An introduction to graphs and a sampling of their numerous and diverse applications
- 439. Combinatorics.** 3 hrs. Prerequisites: MAT 169, 326, and 340. Counting and enumeration techniques, inversion formulas and their applications, and counting schemata relative to permutations of objects
- 441. Advanced Calculus I.** 3 hrs. Prerequisites: MAT 280, 326, and 340. Point set theory, sequences, continuity, uniform continuity, limits, mean value theorems and L'Hospital's rule
- 442. Advanced Calculus II.** 3 hrs. Prerequisite: MAT 441. Riemann integration, Taylor's theorem, improper integrals, infinite series and uniform convergence
- 457. Methods in Mathematics-Secondary.** 3 hrs. Prerequisites: CIS 313, MAT 280, 285, 326, and 340, PSY 374. A course designed to give the students a knowledge of the objectives, curriculum problems and organization and methods of teaching secondary school mathematics (Does not count as an upper-level mathematics elective.)
- 457L. Methods in Mathematics-Secondary Laboratory.** 1 hr. Corequisite: MAT 457. A practicum with a minimum of 15 contact hours in a school setting (Does not count as an upper-level mathematics elective.)
- 460. Numerical Analysis I.** 3 hrs. Prerequisites: MAT 280, 326, and knowledge of a programming language. Methods of solving equations and systems of equations, error analysis and difference equations
- 461. Numerical Analysis II.** 3 hrs. Prerequisites: MAT 285 and 460. Interpolating polynomials, numerical differentiation and integration, numerical solutions of differential equations, and roundoff error
- 472. Modern Geometry.** 3 hrs. Prerequisites: MAT 280, 326, and 340. Heuristic and analytic treatment of a branch of modern geometry, such as projective or differential geometry
- 475. General Topology.** 3 hrs. Prerequisites: MAT 169, 326, and 340. General topological spaces, bases and subbases, and continuity
- 481. History of Mathematics.** 3 hrs. Prerequisites: MAT 169, 326, and 340. Historical development of number and number systems, measurement, algebra, Euclidean and non-Euclidean geometries, calculus, discrete mathematics, statistics and probability including contributions from diverse cultures to each of these mathematical branches. Reasoning and proof, communication, problem solving, connections, representations are integrated throughout the course (Does not count as an upper-level mathematics elective.)
- 485. Mathematical Modeling.** 3 hrs. Prerequisites: MAT 280, 285, 326, and a programming language. An introduction to mathematical modeling using case studies; projects and presentations are required
- +489. Student Teaching in Mathematics I.** 6 hrs. Prerequisite: Approval of the director of student teaching. Corequisite: MAT 490
- +490. Student Teaching in Mathematics II.** 6 hrs. Prerequisite: Approval of the director of student teaching. Corequisite: MAT 489
- 492. Special Problems I, II.** 1-3 hrs. Prerequisite: Approval of department chair. Students undertaking a Senior Honors Project will enroll in MAT H492
- 494. Undergraduate Mathematics Seminars I, II.** 1 hr. Prerequisite: Consent of instructor. Topics of current interest

MEDICAL TECHNOLOGY (MTC)

- 101. Introduction to Medical Technology.** 1 hr. An introduction for incoming students to the scope, objectives and requirements for a career in medical technology
- 102. Introduction to Allied Health Professions.** 1 hr. Introduction to careers in allied health professions including roles, work responsibilities, interaction with patients, educational requirements, salary potential and employment trends
- 110. Phlebotomy I.** 1 hr. Prerequisite: High school graduation or equivalent and admission to the phlebotomy program; didactic material regarding the practice of phlebotomy
- +111. Phlebotomy Practicum.** 1 hr. Prerequisite: A grade of 75 percent or above in MTC 110. Practical experience in the practice of phlebotomy
- 201. Medical Terminology.** 2 hr. A study of terms used in health-related professions
- 202. Safety for Health Care Settings.** 1 hr. Acquaints student with principles, procedures and regulations for six major categories of safety related to laboratories
- 203. Clinical Laboratory Calculations.** 3 hrs. Prerequisite: MAT 101 (grade C or higher). Acquaints student with calculations and applications for laboratories
- 301. Professional Communication.** 2 hrs. Prerequisite: Medical technology major or permission of the instructor. Concurrent course: MTC 301L. Professional writing, speaking and computer skills
- 301L. Professional Communication Laboratory.** 2 hrs. Prerequisite: Medical Technology major or permission of the instructor. Concurrent with MTC 301. Professional writing, speaking and computer skills
- 302. Clinical Bacteriology I.** 3 hrs. Prerequisites: MTC 202, MTC 203, BSC 110, 110L, BSC 380, 380L or permission of instructor. Corequisite: MTC 302L. MTC 315 recommended. Evaluation of clinical specimens with regard to pathogenic microorganisms. See admission to junior-level MTC courses
- +302L. Clinical Bacteriology I Laboratory.** 2 hrs. Prerequisite: MTC 202, MTC 203, BSC 110, 110L, BSC 380, 380L or permission of instructor. Corequisite: MTC 302