Course Master Catalog

MATH

MATH0004
Preparatory Mathematics
A review of the arithmetic operations involving whole numbers, fractions, decimals, percents, and signed numbers; introductory work with exponentiation, root extraction; measurement. Algebra is introduced as the generalization of the processes of arithmetic. Problem solving is emphasized. Note: This is a half-semester course. Credit Level:U Credit Hrs:2

MATH0029
Mathematical Literacy
This is a developmental course designed to prepare students for college-level QR requirements in the non STEM programs. Students will solve problems that require understanding of ratios, rates, and scaling. Students will also learn the language and structure of algebra as well as how to represent relationships between quantities in multiple ways. In particular, students will learn to solve problems that require an understanding of functions and modeling with functions. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking.

MATH0032
Introductory Algebra I
A review of high school algebra. Topics include operations with integers and rational numbers, properties of real numbers, algebraic expressions, linear equations and inequalities in one variable, introduction to functions, graphing equations in two variables, slope, equations of lines, systems of equations, applications. Note: This is a half-semester course. Credit Level:U Credit Hrs:2 Pre-req: See your college advisor for details.

MATH0033
Introductory Algebra II
Further topics from high school algebra, including exponents, polynomials, factoring, rational functions, applications. Note: This is a half-semester course. Credit Level:U Credit Hrs:2 Pre-req: See your college advisor for details.

MATH0034
Intermediate Algebra
Review of introductory algebra, graphing of functions, inequalities and absolute value, radicals, roots and rational exponents, complex numbers, quadratic equations, exponential and logarithmic functions, right triangle trigonometry, applications. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details.

MATH0039
Algebra for College Mathematics
A mathematics developmental course that uses technology and individualized instruction to provide a review of basic, introductory, and intermediate algebra. It provides students with the necessary background and skills to be successful in entry-level college mathematics courses. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking.

MATH1006
Introduction to Mathematical Reasoning
The course begins with a study of Polya's four-step problem solving method. We explore sets and use Venn's diagrams to discover properties of set operations. Students use this knowledge to model operations with numbers and analyze properties of different number systems. Students will use mathematical reasoning and the Polya problem solving process to solve various real world problems and interpret their solutions. Credit Level:U Credit Hrs:3 BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1008
Foundations of Quantitative Reasoning
Project-based course, emphasizing problem-solving, model-building, and basic data manipulation in real world contexts. Topics include: problem-solving, statistical reasoning, linear and exponential modeling, and modeling with geometry. Prereq: at least 420 on the MPT recommended. Credit Level:U Credit Hrs:3 BoK:QR. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy.
MATH1012
Mathematics in Management Science
A quantitative reasoning course for students in the liberal arts. This course examines methods for planning, scheduling, designing routes, and optimizing the use of resources to meet business, government, and individual goals, via linear programming and algorithms that use graphs, networks, and diagrams to model real problems. Also, the course includes a brief introduction to cryptography and investigates mathematical methods to store and transmit information in a way that is accurate, secured and economical. Pre-requisite: at least 420 on the MPT recommended. Credit Level:U Credit Hrs:3 BoK:QR. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy.

MATH1014
Mathematics of Social Choice
A quantitative reasoning course for students in the liberal arts. Contains the study of voting systems and fair division, apportionment using divisor methods, and game theory. Pre-requisite: at least 420 on the MPT recommended. Credit Level:U Credit Hrs:3 BoK:QR. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy.

MATH1021
College Algebra
Study of linear, polynomial, rational, exponential, and logarithmic functions, systems of linear equations, systems of inequalities and modeling with functions. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1022
Trigonometry
Preparation for students who need trigonometry for calculus and/or physics. Right triangle trigonometry, trigonometric functions and graphs, trigonometric identities, vectors, conic sections, polar coordinates. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1026
Pre-Calculus
Study of functions, equations and systems of equations, sequences and series, trigonometry, and vectors, and assumes prior exposure to these topics. This course helps prepare students for the 4 credit hour calculus sequence (MATH 1061 and 1062). Credit Level:U Credit Hrs:5 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1044
Applied Calculus I
The first part of a two semester sequence (MATH1044 and 1045) of courses on calculus appropriate for students in business and life sciences. Topics covered include functions, graphs, limits, continuity, properties of exponential and logarithmic functions, differentiation, curve sketching, optimization and the definite integral. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1045
Applied Calculus II
The second part of a two semester sequence (MATH1044 and 1045) on calculus appropriate for students in business and life sciences. Topics covered include antiderdifferentiation, the fundamental theorem of calculus, functions of two variables, partial derivatives, maxima and minima, Lagrange multipliers and applications to probability and other areas. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1059
Foundations of Scientific Calculus
The course is a focused review and coverage of the mathematical tools necessary to study Calculus for the Sciences. Credit Level:U Credit Hrs:4 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking.
MATH1060
Calculus I with Pre-Calculus Review
The course is an integrated review of functions, equations and systems of equations, sequences and series, trigonometry, and vectors with a comprehensive study of limits and continuity, differentiation, applications of the derivative, optimization, antiderivatives, fundamental theorem of calculus, definite and indefinite integrals. Credit Level:U Credit Hrs:6 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1061
Calculus I
The first part of a three semester sequence of courses on calculus (MATH 1061, 1062, 2063) for students in engineering and science. Topics covered include functions, limits and continuity, differentiation, applications of the derivative, optimization, antiderivatives, fundamental theorem of calculus, definite and indefinite integrals. Credit Level:U Credit Hrs:4 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1062
Calculus II
The second part of a three semester sequence of courses on calculus (MATH 1061, 1062, 2063) for students in engineering and science. Topics covered include techniques of integration, applications of the integral, sequences and series, and vectors. Credit Level:U Credit Hrs:4 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1071
Introduction to Discrete Mathematics
A course designed for students interested in information technology and programming that includes topics in logic, number systems, set theory, methods of proof, probability, logic networks, and graph theory. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH1974
College Algebra II
Rational functions, conic sections, exponential and logarithmic function, systems of equations and inequalities. Credit Level:U Credit Hrs:2 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH2063
Multivariable Calculus
Study of lines and planes, vector-valued functions, partial derivatives and their applications, multiple integrals, and calculus of vector fields. Credit Level:U Credit Hrs:4 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH2073
Ordinary Differential Equations

MATH2076
Linear Algebra
Study of linear equations, matrices, Euclidean n-space and its subspaces, bases, dimension, coordinates, orthogonality, linear transformations, determinants, eigenvalues and eigenvectors, diagonalization. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.
MATH2952
Calculus IB
This is a transition course covering the difference between first-quarter calculus and first-semester calculus. Topics include Riemann sums, the Fundamental Theorem of Calculus, definite and indefinite integrals, integration by substitution, and finding areas of planar regions. Credit Level:U Credit Hrs:2 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH2953
Calculus III
Sequences, series, lines and planes in space, vector-valued functions. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.

MATH2961
Calculus IB
This is a transition course covering the difference between first-quarter calculus and first-semester calculus. Topics include Riemann sums, the Fundamental Theorem of Calculus, definite and indefinite integrals, integration by substitution, and finding areas of planar regions. Credit Level:U Credit Hrs:2 Pre-req: See your college advisor for details.

MATH3001
Introduction to Abstract Math
An introduction to writing mathematical proofs with an emphasis on understanding the language of logic and quantifiers. Students will be introduced to the basic concepts of set theory, functions, relations, and cardinality. The students will develop their ability to write correct mathematical proofs by proving elementary results in these areas. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. TouchPoint:MidCollegiate Baccalaureate Competency: Critical Thinking, Effective Communication.

MATH3002
Introduction to Analysis
The course will introduce analysis of functions through a study of the theoretical basis for results used in Calculus. The course will cover properties of the real and rational number systems, properties of real-valued functions, including continuity and differentiability, Riemann integrals and the Fundamental Theorem of Calculus, and properties of sequences and series. The formal definition of a limit will be a unifying theme for many of the concepts studied in the course. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. TouchPoint:MidCollegiate Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration.

MATH3004
Introduction to Abstract Algebra
The course will focus on an introduction to commutative rings, primarily the integers, the integers modulo n, fields, and polynomials with coefficients in a field. Matrix rings may be presented as an example of a noncommutative ring. Divisibility, factorization, primality and irreducibility in the integers and polynomial rings will be studied. The concepts of homomorphism, isomorphism, congruence classes, ideals and quotient structures will be introduced. Examples of Euclidean domains, principal ideal domains, and unique factorization domains may be studied. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration.

MATH3005
Introduction to Geometry
An axiomatic treatment of synthetic geometry is given, beginning with a development of neutral geometry, or geometry without the Parallel Postulate; theorems of neutral geometry are valid in both hyperbolic and Euclidean geometry. The formal development of Euclidean geometry begins with the addition of the Parallel Postulate. The main tools in Euclidean geometry are congruence and similarity of figures; triangles, quadrilaterals, and circles are studied in detail. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration.
MATH3006
Mathematical Modeling
Basic ideas of mathematical modeling, using differential equations, numerical methods, and perturbation techniques. Focus will be on learning and applying the techniques of applied mathematics to solve real-world problems. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

MATH3008
Introduction to Financial Mathematics
This course is a mathematical treatment of some fundamental concepts in financial mathematics pertaining to the calculation of present and accumulated values for various streams of cash flows, and includes discussion of interest, annuities, loans, bonds, portfolios, and financial instruments used for risk management. The concept of no-arbitrage pricing will be presented and used. This course is intended as an introduction to the material for the SOA/CAS Actuarial Exam FM/2. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Knowledge Integration, Social Responsibility.

MATH3021
Mathematics for Middle School Teachers I: Number Sense
Inquiry-based approach to middle-school content areas of arithmetic (number systems, proportional reasoning, fractions, place value), geometry (shapes, measurement, transformations), algebra (with connections to arithmetic and geometry, as well as real-world problem-solving), functions and graphs, and discrete mathematics. Emphasis on developing mathematical understanding needed to teach these concepts effectively. This first course focuses on the development of number sense, including the representation of numbers, figurate numbers and pattern descriptions, number systems, place value, proportional reasoning, and fractions. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration, Social Responsibility.

MATH3022
Mathematics for Middle School Teachers II: Algebra
Inquiry-based approach to middle-school content areas of arithmetic (number systems, proportional reasoning, fractions, place value), geometry (shapes, measurement, transformations), algebra (with connections to arithmetic and geometry, as well as real-world problem-solving), functions and graphs, and discrete mathematics. Emphasis on developing mathematical understanding needed to teach these concepts effectively. This second course focuses on the understanding of algebra, including algebraic problem-solving skills, pattern recognition and description, use of variables, using algebra and the coordinate plane to describe geometric objects, and the understanding of algebra as an extension of arithmetic. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration, Social Responsibility.

MATH3023
Mathematics for Middle School Teachers III: Geometry
Inquiry-based approach to middle-school content areas of arithmetic (number systems, proportional reasoning, fractions, place value), geometry (shapes, measurement, transformations), algebra (with connections to arithmetic and geometry, as well as real-world problem-solving), functions and graphs, and discrete mathematics. Emphasis on developing mathematical understanding needed to teach these concepts effectively. This third course focuses on the understanding of geometry, including geometric problem-solving skills, description of geometric shapes, measurement, transformations of geometric figures, and continued work in using algebra and the coordinate plane to describe geometric objects and to solve geometric problems. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration, Social Responsibility.

MATH3952
Linear Algebra II
Orthogonality, linear transformations, determinants, eigenvalues and eigenvectors, diagonalization. Credit Level:U Credit Hrs:2 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking.
MATH4001  
Special Topics in Mathematics
This occasionally offered course will allow the student to be exposed to topics in mathematics that are not offered as part of our regular sequence of undergraduate mathematics courses. It will allow students to gain appreciation for the breadth of fields that are part of modern mathematics. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration, Social Responsibility.

MATH4008  
Introduction to Probability
This course is an introduction to mathematical probability suitable as preparation for actuarial science, statistical theory, and mathematical modeling. Topics include: review of general probability rules, conditional probability and Bayes theorem, discrete and continuous random variables, standard discrete and continuous distributions and their properties, with emphasis on moments and moment generating functions, joint, marginal and conditional distributions, transformations of variables, order statistics, and the central limit theorem. Includes practice for the SOA/CAS Actuarial Exam P/1. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking.

MATH4011  
Introduction to Number Theory
Topics include number-theoretic functions, congruences, primes and factorization, Diophantine equations, primitive roots and indices, quadratic residues, quadratic reciprocity, quadratic forms, quadratic fields. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication.

MATH4012  
Differential Geometry and Topology
This is a topics course for advanced undergraduate math majors covering selected ideas from Topology and Differential Geometry. It will serve as an introduction to the ideas, problems, and methods in point set topology and/or differential geometry. Specific topics may include topologies and their bases, construction of topological spaces, metric spaces, open/closed sets, limit points, continuous maps, connectedness, compactness, surfaces in 3-space, tangent planes and the differential of a map, differential forms, orientation, the Gauss map, curvature, vector fields on surfaces, geodesics, the exponential map, the Gauss-Bonnet theorem. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration.

MATH4047  
Individual Work in Undergraduate Mathematical Sciences
Individual Work in Undergraduate Mathematical Sciences allows students to focus on topics outside in the standard curriculum in Mathematics and Statistics. Students work closely with faculty to develop reading lists and assignments. Permission of the Undergraduate Program Director is required. Credit Level:U Credit Hrs:1 - 4 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

MATH5001  
Capstone Seminar in Mathematics
Capstone Seminar is designed for students in their final year of undergraduate study to explore a specific topic in the mathematical sciences through seminar-style learning. Participants will be responsible for preparing seminar lectures to present to the class, under the direction of the faculty instructor. The topics will be chosen to allow integration of material learned in core curriculum courses applied to mathematical topics not generally taught in other undergraduate courses. Participants will be expected to demonstrate active engagement in the seminar presentations of fellow students through appropriate questions and feedback. Topics chosen will vary each term. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. TouchPoint:Capstone Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.
MATH5002
Capstone Project in Mathematics
Capstone Project is designed to allow students in their final undergraduate year to explore a specific topic in the mathematical sciences through an independent, student-designed project under the mentorship of a faculty instructor. Students will be expected to develop their own project proposal with direction from their faculty mentor. The topic should be chosen to allow integration of material learned in core curriculum courses applied to a mathematical topic not generally taught in other undergraduate courses, or at a depth greater than achieved in such courses. Students will be expected to produce a substantial independent thesis, expository paper, applied mathematics or statistics project, or portfolio of relevant mathematical work. Students will be encouraged to present their project in a public forum. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. TouchPoint: Capstone Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

MATH6001
Advanced Calculus I
This course studies the analysis of functions on the real line, \( \mathbb{R}^n \), and metric spaces, starting with basic set theory and axioms of the reals and complex numbers, and extensions to more general spaces (\( \mathbb{R}^n \) and metric spaces). Notions of continuity, convergence, and differentiability are emphasized. Material covered includes: basic set theory, union, intersection, complement, universe, De Morgan Laws. Finite, countable, and uncountable sets. Basic axioms and operation rules of real and complex numbers. Open, closed, and compact sets and properties in \( \mathbb{R}^n \). Metric spaces, bounded and unbounded sets. Convergent sequences and series, Cauchy sequences. Upper and lower limits. Bolzano-Weierstrass Theorem. Series and various tests for convergence and absolute convergence. Functions on any set, and limits and continuity of functions on metric spaces. Abstract description of continuity in terms of open and closed subsets. Continuity and compactness, continuity and connectedness. Limits and derivatives of functions on the real line. L'Hospital's rule, higher order derivatives. Examples of everywhere continuous but nowhere differentiable functions. Credit Level:U,G Credit Hrs:4 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration.

MATH6002
Advanced Calculus II

MATH6003
Abstract Linear Algebra
The course will study topics in linear algebra in the abstract setting, including abstract vector spaces, subspaces, isomorphisms, quotient spaces, linear independence, basis, dimension. Additional topics include linear functionals, duals, codimension, linear mappings, null space, range, Rank-Nullity theorem, transpositions, similarity, projections, matrices, Gaussian elimination, determinants, eigenvalues, eigenvectors, Spectral Mapping and Cayley-Hamilton theorems, minimal and characteristic polynomials, similarity of matrices, canonical forms. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration.
MATH6004
Group Theory

MATH6005
Introduction to Complex Analysis
Complex numbers considered algebraically and geometrically, polar form, powers and roots, derivative of complex-valued functions, analyticity, Cauchy-Riemann equations, harmonic functions, elementary functions, and their derivatives, visualization of complex-valued functions, conformal mapping, elementary functions as conformal mappings, integration of complex-valued functions, Cauchy's Integral Theorem, Cauchy's Integral Formula, residue theory and applications, basics of Mobius transformations. Credit Level: U, G Credit Hrs: 3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration.

MATH6006
Numerical Analysis
Topics will include floating point arithmetic, root finding for nonlinear equations, fixed point analysis, stability, interpolation theory, least squares methods for function approximation and numerical methods for integration. A primary focus is on the use of Taylor's theorem to analyze the methods. The analysis will be emphasized here instead of computation. Carefully chosen model or prototype problems will be examined in order to furnish theorems and insight into the behavior of the approximation methods. Credit Level: U, G Credit Hrs: 3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration.

MATH6007
Partial Differential Equations and Fourier Analysis

MATH6008
Applied Probability and Stochastic Processes
A review of random variables and probability theory with an emphasis on conditioning as a technique for computing probabilities and expectations. Detailed study of discrete and continuous time Markov chains and Poisson processes, with introduction to one or more of the following: martingales, Brownian motion, random walks, renewal theory. Credit Level: U, G Credit Hrs: 3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

MATH6010
Probabilistic Aspects of Financial Modeling
This course begins with models for finite financial markets in discrete time, covering derivatives, arbitrage pricing, market completeness, trading strategies, replicating portfolios, and risk neutral measures in this context, and constructing single and multiple period binomial tree models for modeling stock prices and pricing options. Then the analogous continuous time theory is developed. Concepts and techniques from probability and stochastic processes are introduced, including Brownian motion, martingales and stochastic calculus, in order to derive the martingale (risk-neutral) approach to solving the Black-Scholes p.d.e. and pricing a variety of financial contracts and derivatives. This course will be useful for students preparing for the Financial Economics segment of Actuarial Exam M. Credit Level: U, G Credit Hrs: 3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.
MATH6011
Computational Financial Mathematics
The course covers financial mathematics from the basics to advanced techniques and concepts. Financial mathematics and corresponding mathematical concepts are explained and derived mathematically while being implemented through programming in Mathematica at the same time. No knowledge of Mathematica is required, but will be gained quickly, as it is used extensively. Topics include: Elementary stochastic differential equation (SDE); Monte-Carlo simulations; Ito chain rule; Log-Normal market model; derivation of the Black-Scholes partial differential equation (PDE) - pricing and hedging in complete markets; statistics of SDEs; statistical and implied volatility; local volatility pricing models and numerical PDEs; American options and free boundary problems; optimal portfolio theory; introduction to pricing and hedging in incomplete markets. Credit Level: U,G Credit Hrs: 3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

MATH6012
Applied Linear Algebra

MATH6015
Mathematical Programming
Applications of mathematical programming using packages such as MATLAB and Mathematica. Projects will encompass calculus, linear algebra, and differential equations. Credit Level: U,G Credit Hrs: 3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

MATH6048
Advanced Topics in Math/Stat I
The course will vary according to the topic. Credit Level: U,G Credit Hrs: 2-4 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking.

MATH6049
Advanced Topics in Math/Stat II
The course will vary according to the topic. Credit Level: U,G Credit Hrs: 2-4 Baccalaureate Competency: Critical Thinking.

MATH6051
Applied Ordinary Differential Equations
This course is intended for undergraduates and for graduate students in other departments; it is not intended for graduate students in the mathematical sciences. It covers the theory of ordinary differential equations, with an emphasis on applications. Basic concepts, special types of differential equations of the first order, and problems that lead to them, linear differential equations of order greater than one and problems that lead to them. Linear vector spaces, systems of differential equations, linearization of first order systems, problems giving rise to systems, existence and uniqueness theorem for first order differential equations, existence and uniqueness theorem for a system of first order differential equations and for linear and nonlinear differential equations of order greater than one. Wronskians. Other supplementary topics: state variable description of systems, fundamental matrix, state transition matrix, matrix exponential, stability of linear systems, time permitting, operators and Laplace transforms, series methods Credit Level: U,G Credit Hrs: 3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Information Literacy, Knowledge Integration, Social Responsibility.