College of Letters & Sciences

MATHEMATICAL AND COMPUTER SCIENCES COURSES (MATH, COMPSCI)

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MATHEMATICS (MATH)

MATH-542
Applied Statistics 3 cr
This course will cover the basics of statistical testing, regression analysis, experimental design, analysis of variance, the use of computers to analyze statistical problems.
Prereq: MATH-253 or MATH-250 or consent of instructor.
Unreq: ECON-245.

MATH-555
Matrices And Linear Algebra 3 cr
Systems of linear equations, vector spaces, linear dependence, bases, dimension, linear mappings, matrices, determinants, quadratic forms, orthogonal reduction to diagonal form, eigenvalues, geometric applications.
Prereq: MATH-254 or concurrent registration.

MATH-565
Linear Programming 3 cr
A study of the vector-matrix theory and computational techniques of the simplex method, duality theorem, degeneracy problem, transportation problems and their applications to engineering and economics. Programming and machine solution of linear programming problems.
Prereq: MATH-171 and MATH-355/555, or consent of instructor.

MATH-575
Development Of Mathematics 3 cr
A study of the development of mathematical notation and ideas from prehistoric times to the present, with special emphasis being placed on elementary mathematics through the calculus. The development and historic background of the new math will be included.
Prereq: Consent of instructor.

MATH-580
Patterns Of Problem Solving 3 cr
This course will expose students to a variety of techniques useful in solving mathematics problems. The experiences gained from this course can be applied to problems arising in all fields of mathematics. The student will have the chance to see how some general techniques can be used as tools in many areas. Homework for this course will consist mostly of solving a large number of mathematics problems.
Prereq: MATH-280 or consent of instructor. (Consent will be given to students with substantial interest in problem solving, and adequate preparation.)

MATH-615
Modern Algebra And Number Theory For The Elementary Teacher 3 cr
An introduction to modern algebra with special emphasis on the number systems and algorithms which underlie the mathematics curriculum of the elementary school. Topics include sets, rings, integral domains, rational numbers, real numbers, complex numbers and polynomials. Students may not receive credit for both MATH-615 and MATH-652.
Prereq: Consent of instructor.

MATH-616
Geometry For The Elementary Teacher 3 cr
A study of the intuitive, informal geometry of sets of points in space. Topics include elementary constructions, coordinates and graphs, tessellations, transformations, problem solving, and symmetries of polygons and polyhedra.
Prereq: MATH-112 and MATH-152.

MATH-617
Theory Of Numbers 3 cr
A study of the properties of integers, representation of integers in a given base, properties of primes, arithmetic functions, modulo arithmetic. Diophantine equations and quadratic residues. Consideration is also given to some famous problems in number theory.
Prereq: MATH-415/615, or MATH-452/652, or consent of instructor.

MATH-631
Topology 3 cr
An introduction to point-set topology, including such topics as topological spaces, mappings, connectedness, compactness, separation axioms, metric spaces, complete spaces, product paces and function spaces.
Prereq: MATH-255 and either MATH-280 or consent of instructor.

MATH-641
Probability Theory 3 cr
Probability spaces, discrete and continuous random variables, mathematical expectation, discrete and continuous distributions.
Prereq: MATH-255 or consent of instructor.

MATH-642
Mathematical Statistics 3 cr
This course will cover moment generating functions, moment of linear combinations of random variables, conditional expectation, functions of random variables, sampling distributions, the theory of estimation, Bayesian estimation, hypothesis testing, nonparametric tests, and linear models.
Prereq: MATH-441/641 and either MATH-355/555 or consent of instructor.

MATH-646
Actuarial Mathematics 3 cr
This course will discuss the actuarial profession and the insurance industry, provide direction to students wishing to take the first few actuarial examinations, thoroughly cover the theory of interest, and introduce the basic concepts of actuarial mathematics.
Prereq: MATH-441 or concurrent registration.

MATH-652
Introduction to Abstract Algebra 3 cr
An introductory survey of abstract algebra and number theory with emphasis on the development and study of the number system of integers, integers mod n, rationals, reals, and complex numbers. These offer examples of and motivation for the study of the classical algebraic structures of groups, rings integral domains and fields. Application to algebraic coding theory and crystalloprpahy will be developed as time allows.
Prereq: MATH-280
Unreq: MATH-415/615.

MATH-653
Abstract Algebra 3 cr
This course is a continuation of MATH-452/652 with emphasis on ring and field theory. Topics include a review of group theory, polynomial rings, divisibility in integral domains, vector spaces, extension fields, algebraic extension fields, etc.
Prereq: MATH-355/555 and MATH-452/652.

MATH-658
Applied Mathematical Analysis I 3 cr
A course in numerical and series solutions for ordinary differential equations, the Laplace transform, boundary value problems, Fourier series, vector analysis and its physical applications.
Prereq: MATH-361.

MATH-659
Partial Differential Equations 3 cr
Fourier analysis, partial differential equations and boundary value problems, complex variables, and its potential theory.
Prereq: MATH-361.

MATH-664
Advanced Calculus I 3 cr
This course presents a rigorous treatment of the differential and integral calculus of single variable functions, convergence theory of numerical sequences and series, uniform convergence theory of sequences and series of functions, metric spaces, function of several real variables, and the inverse function theorem. This course contains a written component.
Prereq: MATH-301.

MATH-671
Numerical Analysis I 3 cr
Emphasis on numerical algebra. The problems of linear systems, matrix inversion, the complete and special eigenvalue problems, solutions by exact and iterative methods, orthogonalization, gradient methods. Consideration of stability and elementary error analysis. Extensive use of microcomputers and programs using a high level language such as PASCAL.
Prereq: MATH-171 and MATH-355/555

MATH-690
Workshop 1-3 cr

MATH-694
Seminar 2 cr

MATH-696
Special Studies 1-3 cr
Prereq: Consent of instructor.

MATH-790
Workshop 1-6 cr

MATH-794
Seminar 1-3 cr

MATH-798
Individual Studies 1-3 cr

MATH-799
Thesis Research 1-6 cr
Students must complete a Thesis Proposal Form in the Graduate Studies Office before registering for this course.

COMPUTER SCIENCE (COMPSCI)

COMPSCI-502
Computer Logic And Microprocessors 3 cr

Structure of microprocessors and microprocessor systems, programming in machine language, computer logic and logic circuits, interfacing.
Prereq: COMPSCI-171.

COMPSCI-507
Microcomputer Applications 3 cr
This course will treat a variety of applications of microcomputers, as well as their architecture, design and social impact.
Prereq: COMPSCI-171 or consent of instructor.

COMPSCI-572
Intermediate Programming 3 cr
Sequel to COMPSCI-171. Advanced programming language features, techniques, and data structures, learned through the implementation of larger programs; an introduction to algorithm analysis, program verification, recursion and data abstraction.
Prereq: COMPSCI-171
Unreq: MCS-231

COMPSCI-612
Computer Organization And System Programming 3 cr
A study of general computer system organization and architecture. Comparison of CPU and memory structure, instruction formats, addressing, flow of control and operating systems on different type of computers. Assembly language is used extensively to write systems programs.
Prereq: MATH-271 or consent of instructor.

COMPSCI-690
Workshop 1-3 cr
Repeatable.
Prereq: Consent of instructor.

COMPSCI-694
Seminar 2 cr

COMPSCI-696
Special Studies 1-3 cr
Repeatable.
Prereq: Consent of instructor.

COMPSCI-790
Workshop 1-3 cr

COMPSCI-794
Seminar 1-3 cr

COMPSCI-798
Individual Studies 1-3 cr