

# Mathematical and Computer Sciences Courses (MATH, COMPSCI)

## Contact:

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## MATHEMATICS (MATH)

### MATH 542

#### Applied Statistics 3 u

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 u

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 575

#### Development Of Mathematics 3 u

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 u

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 u**

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: MATH 149 and MATH 152.

### **MATH 616**

#### **Geometry For The Elementary Teacher 3 u**

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 149 and MATH 152.

### **MATH 631**

#### **Topology 3 u**

An introduction to point-set topology, including such topics as topological spaces, mappings, connectedness, compactness, separation axioms, metric spaces, complete spaces, product spaces and function spaces.

Prereq: MATH 255 and either MATH 280 or consent of instructor.

### **MATH 641**

#### **Probability Theory 3 u**

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 u**

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 653**

#### **Abstract Algebra 3 u**

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 659**

#### **Partial Differential Equations 3 u**

Fourier analysis, partial differential equations and boundary value problems, complex variables, and its potential theory.

Prereq: MATH 361.

### **MATH 664**

#### **Advanced Calculus 3 u**

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 3 u**

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 u**

### **MATH 694**

#### **Seminar 2 u**

### **MATH 696**

#### **Special Studies 1-3 u**

Prereq: Consent of instructor.

### **MATH 790**

#### **Workshop 1-6 u**

### **MATH 794**

#### **Seminar 1-3 u**

### **MATH 798**

#### **Individual Studies 1-3 u**

**MATH 799**

**Thesis Research 1-6 u**

Students must complete a Thesis Proposal Form in the Graduate Studies Office before registering for this course.

**COMPUTER SCIENCE (COMPSCI)**

**COMPSCI 507**

**Microcomputer Applications 3 u**

This course will treat a variety of applications of microcomputers, as well as their architecture, design and social impact.

Prereq: COMPSCI 171

**COMPSCI 690**

**Workshop 1-3 u**

Repeatable.

Prereq: Consent of instructor.

**COMPSCI 694**

**Seminar 2 u**

**COMPSCI 696**

**Special Studies 1-3 u**

Repeatable.

Prereq: Consent of instructor.

**COMPSCI 790**

**Workshop 1-3 u**

**COMPSCI 794**

**Seminar 1-3 u**

**COMPSCI 798**

**Individual Studies 1-3 u**