Math 102 : Number Theory

California State University, Sacramento · Department of Mathematics & Statistics

Catalog Description

Theory of divisibility; some number theoretical functions; congruencies (linear and quadratic); some Diophantine equations. Simple continued fractions. **Graded**: Graded Student. **Units**: 3.0.

Prerequisites

Math 31

Assignments

A variety of reading and problem solving assignments will be part of the course.

Examinations

There will be regular midterm examinations and a comprehensive final examination for this course.

Course Outline

I. Elementary properties of divisibility and primes

    A. The Euclidean algorithm

    B. The Fundamental theorem of arithmetic

    C. Applications

    D. Multiplication and completely mulitplicative arithmetic

    E. Functions

    F. Linear Diophantine equations

II. Divisors of an Integer

    A. Number of divisors of an integer

    B. Sum of the divisors of an integer

III. Fundamental Properties of Congruences

    A. Linear congruence equations including Chinese remainder theorem

    B. Reduced residue systems and Euler's ϕ-function

    C. Fermat's theorem

    D. Polynomial congruences

    E. Primitive roots

IV. Diophantine Equations

    A. The Use of congruences in solving Diophantine equations