MATH 3496: Elementary Number Theory

3 Credit Hours

Prerequisite: MATH 2390

The course is an introduction to the basic principles of number theory. Topics include properties of integers, congruences, divisibility, the Euclidean algorithm, prime number theorems, multiplicative functions, Diophantine equations, and applications in cryptology.

MATH 3696: College Geometry

3 Credit Hours

Prerequisite: A grade of C or better in MATH 2202

This is a rigorous development of geometry that starts with a close reading of Book I of Euclid's Elements, moves on to geometry developed during the Arabic period and the Renaissance, then to non-euclidean geometries discovered during the 19th century. The course includes a treatment of Hilbert's approach to Euclidean geometry and a brief treatment of real projective geometry. Students taking this course should have a serious interest in abstract mathematics.

MATH 4260: Linear Algebra II

3 Credit Hours

Prerequisite: MATH 3260

Topics in this course include real vector spaces and their subspaces; inner product spaces, orthogonal subspaces, Gram - Schmidt process; best approximation; eigenvalues and eigenvectors; special matrices; matrices of general transformations, and various applications including matrix functions.

MATH 4310: Partial Differential Equations

3 Credit Hours

Prerequisite: MATH 2203 and MATH 2306

This course is an introduction to partial differential equations (PDEs), their applications in the sciences and the techniques that have proved useful in analyzing them. The techniques include separation of variables, Fourier series and Fourier transforms, orthogonal functions and eigenfunction expansions, Bessel functions, and Legendre polynomials. The student will see how the sciences motivate the formulation of partial differential equations as well as the formulation of boundary conditions and initial conditions. Parabolic, hyperbolic, and elliptic PDEs will be studied.