

MATH 197

(Introduction to Coding Theory)

This course is an introduction to linear codes, one of the main classes of error-correcting codes. Introduced in the 1940s, error-correcting codes are used in the reliable transmission of data through noise channels. Applications include communication systems, storage devices and cryptographic protocols. In this course, we will study the basic concepts in the theory of linear codes. Most of the tools and techniques will come from algebra, some from combinatorics and geometry.

Prerequisites: Math 114 (Linear Algebra)/equiv

MATH 197

(Introduction to Enumerative Combinatorics)

This course deals with counting methods, binomial and multinomial coefficients, inclusion and exclusion, recurrence relations, generating functions, and pigeonhole principle.

Prerequisites: Math 65 (Elementary Analysis III) and Math 114 (Linear Algebra)/equiv

MATH 197

(Introduction to Partial Differential Equations)

This course covers basic concepts, definitions and applications of partial differential equations (PDEs), classification of PDEs, solutions to PDEs

Prerequisites: Math 122 (Elementary Differential Equations) and Math 114 (Linear Algebra)/equiv

MATH 297

(Deformation Quantization)

Deformation Quantization is one of the recent developments in mathematics brought about by Quantum Mechanics. It is considered as a result of math and physics through quantum mechanics. The course includes an introduction to Poisson geometry, deformation quantization of commutative and Poisson structures and an introduction to Differentiated Graded Lie Algebras and its relevance to deformation quantization.

This is a Geometry Elective for MS Math and PhD Math programs.

Prerequisite: Math 110.1 (Abstract Algebra I) or COI

MATH 297

(Introduction to Quantum Information Theory)

This course covers basic concepts in Quantum Information Theory such as quantum states, measurements, channels and some advanced topics.

Prerequisite: Math 110.2 (Abstract Algebra II) or COI

MATH 297

(Actuarial Models)

This is a course covers methods of constructing empirical models from complete and modified data, implementation of several methods of constructing and selecting parametric models from complete and modified data, Bayesian estimation and statistical inference, concepts and methods under credibility theory.

Prerequisite: Math 261 (Survival and Loss Models)

MATH 297

(Machine Learning and Deep Learning I)

This is a course deals with the basics of machine learning, in particular, deep learning, a method that works on algorithms inspired by artificial neural networks. This course is a good foundation for those interested in Data Science.

Prerequisite: Math 114 (Linear Algebra)/ equiv