Nico A. Espinosa Dice

Courses taken in mathematics and computer science.

Mathematics Courses

MATH189R: Mathematics of Big Data — In Progress

Taught by Weiqing Gu — *Spring 2020*

Machine Learning: A Probabilistic Perspective by Kevin P. Murphy

"In this course, we will start with big data challenges and examples. Then we will demonstrate how to use mathematical techniques to process big raw data including data indexing, visualization, structuring, representing, and reducing data dimension. We then present mathematical techniques for overcoming big data challenges especially focusing on the mathematics behind machine learning black boxes. Students will learn how to select an appropriate existing algorithm or a specific machine learning method, or integrate different algorithms for the big data problem at hand. We will use several examples including topic modeling and anomaly detection to demonstrate the key points involved, such as how to select an appropriate metric to distinguish between the normal and abnormal. We will end the course by demonstrating several examples of big data to decision using mathematical techniques."

MATH171: Abstract Algebra I — In Progress

Taught by Jessalyn Bolkema — *Spring 2020*

Abstract Algebra by David S. Dummit and Richard M. Foote

"Groups, rings, fields and additional topics. Topics in group theory include groups, subgroups, quotient groups, Lagrange's theorem, symmetry groups, and the isomorphism theorems. Topics in Ring theory include Euclidean domains, PIDs, UFDs, fields, polynomial rings, ideal theory, and the isomorphism theorems. In recent years, additional topics have included the Sylow theorems, group actions, modules, representations, and introductory category theory."

MATH055: Discrete Mathematics — A-

Taught by Michael E. Orrison — *Fall 2019*

Mathematics: A Discrete Introduction by Edward R. Scheinerman

"Topics include combinatorics, number theory, and graph theory with an emphasis on creative problem solving and learning to read and write rigorous proofs. Possible applications include probability, analysis of algorithms, and cryptography."

MATH065: Differential Equations/Linear Algebra II — A-

Taught by Andrew J. Bernoff — *Fall 2019*

Linear Algebra: A Modern Introduction by David Poole

MATH060: Multivariable Calculus — A

Taught by Yesim Demiroglu — *Fall 2019*

MATH045: Introduction to Differential Equations — A

Taught by Victoria Noquez — *Spring 2019*

MATH035: Probability and Statistics — High Pass

Taught by Mohamed Omar — *Fall 2018*

OpenIntro Statistics by Christopher D. Barr, David M. Diez, and Mine Çetinkaya-Rundel

MATH030B: Calculus — Pass

Taught by Michael E. Orrison — *Fall 2018*

Calculus by Michael Spivak

Computer Science Courses

CSCI081: Computability and Logic — In Progress

Taught by George D. Montañez — *Spring 2020*

"An introduction to some of the mathematical foundations of computer science, particularly logic, automata and computability theory. Develops skill in constructing and writing proofs, and demonstrates the applications of the aforementioned areas to problems of practical significance."

CSCI070: Data Structures and Program Development — In Progress

Taught by Beth Trushkowsky — *Spring 2020*

"Abstract data types including priority queues and dynamic dictionaries and efficient data structures for these data types, including heaps, self-balancing trees and hash tables. Analysis of data structures including worst-case, average-case and amortized analysis. Storage allocation and reclamation. Secondary storage considerations. Extensive practice building programs for a variety of applications."

CSCI060: Principles of Computer Science — A

Taught by Katherine Breeden — *Spring 2019*

"Introduction to principles of computer science: Information structures, functional programming, object-oriented programming, grammars, logic, logic programming, correctness, algorithms, complexity analysis, finite-state machines, basic processor architecture and theoretical limitations."

CSCI005: Introduction to Computer Science — Pass

Taught by Julie Medero — *Fall 2018*

Miscellaneous Courses

MATH199: Mathematics Colloquium — In Progress

Taught by Weiqing Gu — *Spring 2020*

MATH093: Putnam Seminar — Pass

Taught by Andrew J. Bernoff and Nicholas Pippenger — *Fall 2018*