Fall 2019:

Discrete Math(MATH 311W). Involved topics: modular arithmetic, set theory, formal logic, groups. Textbook: Numbers, Groups, and Codes, by Humphreys and Prest

Foundations of Geometry(MATH 429) involved topics: Euclid’s elements, None-Euclidean Geometry, Transfomal Geometry, Differential Geometry, Axiomatic Systems. Textbook: Euclidean plane and its relatives

Linear Programming(MATH 484) involved topics: Tableaux and Pivoting, Simplex Method, Duality, Transportation Problem. Textbook: None

Game Theory(MATH 486) Textbook: Game Theory in Action: An Introduction to Classical and Evolutionary Models

Spring 2020:

Real Analysis(MATH 312) involved topics: Number theory, Sequence, Continuity, Sequences and Series of Functions, Differentiation. Textbook: Elementary Analysis: The Theory of Calculus by Kenneth A. Ross 2th edition

Intro Probability theory(MATH 414) involved topics: fundamental properties of probability, discrete random variables and distributions, continues randome variables, two random variables, moment-generating function. Textbook: None

Intro of topology(MATH 429) involved topics: metric spaces, topological spaces, separation axioms, product spaces, identification spaces, compactness, connectedness. Textbook: Introduction to Metric and Topological Spaces by Wilson A. Sutherland

Linear Algebra(MATH 436) involved topics: vector spaces, linear transformations and matrices, diagonalization, inner product spaces, canonical forms. Textbook: Linear Algebra, 4th Edition by S. Friedberg, A. Insel, and L. Spence

Fall 2020:

Analysis I(MATH 403) involved topics: topology of Rn, compactness, continuity of functions, uniform convergence, Arzela-Ascoli theorem, Stone-Weistrass theorem. Textbook: principles of mathematical analysis by Walter Rudin

Intro Math Stat(MATH 415) involved topics: point estimation, interval estimation, hypothesis testing, linear models, analysis of categorical data, Bayesian estimation. Textbook: None

Linear algebra and its Applications(MATH 535) involved topics: fields and vector spaces, linear transformations, inner product and quadratic forms, orthogonal bases. Textbook: Linear Algebra and Its Applications by Peter Lax

Abstract Algebra(MATH 536) involved topics: groups, group actions, rings, modules over principal ideal domains, field extensions, finite fields. Textbook: Abstract Algebra, by David Dummit and Richard Foote.

Spring 2021:

Analysis II(MATH 404) involved topics: Riemann-Stieltjes integral, completeness, functions of several variables, integration of differential forms, Lebesgue Theory. Textbook: principles of mathematical analysis by Walter Rudin

Fall 2021:

Functions of a Complex Variable(APMA 4204) involved topics: metric topology on complex plane, sequence and series of complex numbers, differentiation, Taylor series, Laurent series, singularity and residue calculus, integral transforms. Textbook: Complex Variables: Introduction and Applications

Numerical Methods(APMA 4300) involved topics: errors, root finding and optimization, interpolation, differentiation, quadrature, numerical linear algebra. Textbook: None

Numerical analysis and optimization(APMA 4990) involved topics: unconstrained optimization, least squares, gradient method, convexity, linearly constrained problems, KKT conditions. Textbook: Convex Optimization by Stephen Boyd, and Lieven Vandenberghe

Spring 2022:

Applied Stochastic Analysis(APMA 4306) involved topics: Markov chain, Monte Carlo methods, stochastic process, Fokker-Planck equation theory, stochastic approximation and asymptotic analysis. Textbook: Applied Stochastic Analysis by Weinan E, Tiejun Li and Eric Vanden-Einden

Analysis of Algorithms I(CSOR 4231) involved topics: asympotics and recurrences, sorting and searching, greedy algorithms, amortized analysis, dynamic programming, graph algorithms, randomized algorithms, approximations algorithms, NP-completeness. Textbook: Introduction to Algorithms by Ronald Rivest

Math in Data Analysis(APMA 4990) involved topics: singular value decomposition, spectral decomposition, randomized linear algebra, Fourier transforms, convolutions, stochastic gradient descent, conjugate gradients, alternating direction method of multipliers. Textbook: Linear Algebra and Learning from Data by Gilbert Strang