Undergraduate-level courses taken:

Course Number	Title	Instructor	Textbook(s)	Course Description	Grade
Math 241	Calculus III (H)	Hildebrand, A.	*Calculus: Early Transcendentals*, by Stewart.	Vectors, curvatures and frames, partial derivatives, multiple integrals, surface and line integrals, Green's theorem, Stokes' theorem, divergence theorem.	A+
Math 347	Fundamental Mathematics (H)	Yong, A.	*Tools of the trade: introduction to advanced mathematics*, by Sally	Sets and functions, cardinalities, axiom of choice, basic properties of groups, rings, and fields, constructions of Q and R, topologies of R, metric spaces, continuity, compactness and completeness.	A+
Math 413	Intro to Combinatorics	Yong, A.	*Introductory Combinatorics*, by Brualdi	Binomial coefficients, pigeonhole principle, Sperner's theorem, inclusion and exclusion, sequences and recursion, partitions, generating series, exponential generating series, Catalan's numbers.	A+
Math 416	Abstract Linear Algebra (H)	Di Francesco, P.	*Linear Algebra*, by Friedberg, Insel, and Spence	Vector spaces, linear transformations, system of linear equations, determinants, eigenvalues and eigenvectors, inner product spaces, spectral theorems, Jordan canonical forms.	A+
Math 423	Differential Geometry	Hirani, A.	*Elementary Differential Geometry*, by ONeill.	Frenet formulas, differential forms and connections on surfaces, orientations, curvatures, geodesics, intrinsic geometry of surfaces, Gauss's Theorema Egregium, Gauss-Bonnet theorem.	A+
Math 424	Honors Real Analysis (H)	Erdogan, B.	*Introduction to Analysis*, by RosenLicht.	Metric spaces, continuity, compactness, connectedness, completeness, differentiation, Riemann and Darboux integration, series, interchange of limit operators, Weierstrass approximation, contraction mapping theorem.	A+
Math 427	Honors Abstract Algebra (H)	Lerman, E.	*Introduction to Abstract Algebra*, by Nicholson	Groups, group actions, semidirect products, rings and ideals, PIDs and UFDs, modules, finitely generated modules over PIDs, canonical forms.	A+
Math 441	Differential Equations	Manfroi, A.	*Elementary Differential Equations & Boundary Value Problems*, by Boyce and DiPrima.	First and second order ODEs, Picard's theorem, higher order ODEs, Wronskian and Abel's theorem, series solutions to ODEs, Bessel's equation, systems of ODEs.	A+
Math 448	Complex Variables	Tumanov, A.	*Complex Variables*, by Fisher.	Complex numbers, Cauchy's formula, singularities, Laurent series, residue theorem, argument principle, Möbius transformations, Riemann mapping theorem.	A+
Math 453	Number Theory	Reznick, B.	*Elementary Number Theory*, by Strayer.	Divisibility and congruence, Euler's theorem, arithmetic functions and Dirichlet convolution, quadratic reciprocity, primitive root theorem, Diophantine equations, generating series.	A+
Math 461	Probability Theory	Kim, D.	*A First Course in Probability*, by Ross.	Probability spaces, conditional probabilities, expectation and variance, discrete and continuous random variables, joint distributions, moment generating functions, weak and strong laws of large numbers, central limit theorem.	A+
Math 496	Honors Seminar (H)	Reznick, B.	Various papers.	Independent research seminar, various selected topics in number theory.	A+

(H) = Courses with honors section.

Graduate-level courses taken:

Course Number	Title	Instructor	Textbook(s)	Course Description	Grade
Math 500	Abstract Algebra I	Dodd, C.	*Abstract Algebra*, by Dummit and Foote. *Groups and Representations*, by Alprin and Bell.	Advanced group theory (Jordan-Holder theorem, nilpotent and solvable groups, central series, and derived series, etc.), advanced ring theory, module theory, Galois theory.	A+
Math 511	Intro to Algebraic Geometry	Dodd, C.	*Algebraic Geometry*, by Hartshorne.	Affine varieties, regular maps, projective varieties, dimension theory, birational geometry, blow-up's singularities and smoothness, nonsingular curves.	A+
Math 518	Differentiable Manifolds I	Lerman, E.	*Introduction to Smooth Manifolds*, by Lee.	Manifolds, tangent spaces, regular values, transversality, vector fields and flows, differential forms, Cartan's magic formula, orientations, Stokes' theorem, basic Lie groups and Lie algebras, vector bundles, de Rham cohomology.	A+
Math 519	Differentiable Manifolds II	Pascaleff, J.	*Riemannian Geometry*, by Do Carmo.	Vector bundles, fiber bundles, connections, calculus of variation, geodesics, Hopf-Rinow theorem, curvatures, structural equations, complex vector bundles, characteristic classes.	A+
Math 531	Analytic Number Theory I	Zaharescu, A.	*Multiplicative Number Theory,* by Davenport.	Arithmetic functions, distributions of primes, Riemann zeta function, prime number theorem, Dirichlet L-functions, prime number theorem in arithmetic progressions.	A+
Math 532	Analytic Number Theory II	Thorner, J.	Lecture notes.	Zero density estimates of Dirichlet L-functions, Bombieri-Vinogradov theorem, Linnik's theorem, Hoheisol's theorem, Deuring-Heilbronn zero repulsions, log-free zero density estimates of Selberg class L-functions, Selberg's sieve, Brun-Titchmarsh theorem, weak subconvexity of L-functions.	A+
Math 540	Real Analysis	Erdogan, B.	*Real Analysis: Modern Techniques and Their Applications*, by Folland. *Real and Complex Analysis*, by Rudin.	Measure spaces, Lebesgue integration, Littlewood's three principles, Fubini-Tonelli theorem, Lebesgue differentiation theorem, differentiation of monotone functions, Banach spaces, L^p spaces, Hilbert spaces, Riesz representation theorem, basic Fourier analysis, Baire category theorem and its applications to functional analysis.	A+
Math 542	Complex Variables I	Erdogan, B.	*Functions of One Complex Variable*, by Conway. *An Introduction to Complex Function Theory*, by Palka.	Cauchy's theorem, Phragmen-Lindelof methods, residue theorem, Riemann mapping theorem, Caratheodory-Osgood theorem, Mittag-Leffler and Weierstrass constructions, Gamma function, Riemann zeta function, Runge's theorem, harmonic functions, Poisson-Jensen formula.	A+

Graduate-level courses currently taking:

Course Number	Title	Instructor	Textbook(s)	Course Description	Grade
Math 502	Commutative Algebra	Dutta, S.	*Local Algebra*, by Serre. *Commutative Algebra*, Volumes I and II, by Zariski and Samuel.	Primary decomposition, filtrations and completions, faithfully flat modules, dimension theory, integral extensions, Noether normalization, homological methods, depth and Cohen-Macaulay modules.	N/A
Math 514	Complex Algebraic Geometry	Katz, S.	*Principles of Algebraic Geometry*, by Griffiths and Harris.	Several complex variables, analytic varieties, complex manifolds, sheaves and cohomology, Poincaré duality, holomorphic vector bundles, harmonic forms and Hodge theory, Kähler manifolds, divisors and line bundles, sevanishing theorems, Kodaira embedding theorem.	N/A
Math 595	Distribution of Sequences in Number Theory	Zaharescu, A.	Various papers.	Exponential sums, ternary Goldbach conjecture, uniform distribution, pair correlation of zeros of the Riemann zeta function and more general L-functions, distribution in finite fields, distribution of quadratic residues, newly discovered connections between Farey fractions and the Riemann Hypothesis.	N/A

For reading courses, please see my CV.