Course Description

Department/Major	Code	Course Title	Target Attendee	Course Type	Credit	Self-study Hour(s)	Contact Hour(s) Require	Requirement Type	Description
Mathematics	MTH2002	Number Theory	Undergraduate (low graders)	Theory	3	6	3	Major	Introduction to number theory. This course will cover primes, unique factorization, congruence, quadratic residues, arithmetic functions, Diophantine equations, and Gaussian integers.
Mathematics	MTH2006	Analysis II	Undergraduate (low graders)	Theory	3	6	3	Major	This is a continuing course which follows analysis I. Topics cover: the Riemann-Stieltjes integral, uniform convergence, the stone-weierstrass theorem, special functions, contraction principle, the inverse function theorem, the implicit function theorem, the rank theorem, multivariable calculus, Stokes' theorem, etc.
Mathematics	MTH2007	Differential Equations	Undergraduate (low graders)	Theory	3	6	3	Major	Basic theory of elementary differential equation and its application are dealt with: first order ordinary differential equation, constant coefficient linear ordinary differential, high order ordinary differential equation, solution by series(Legendre differential equation, Bessel differential equation), etc.
Mathematics	MTH2008	Set Theory	Undergraduate (low graders)	Theory	3	6	3	Major	Set theory is for the junior or senior of mathematical sciences as one-semester course. Especially, it is essential for mathematics major students. Sets, union and intersection, Cartesian product, functions, image, inverse image, cardinality, countable and uncountable, relations, equivalence classes, partially ordered and totally ordered sets, axiom of choice, Zorn's lemma are treated.
Mathematics	MTH2011	Computer Aided Applied Mathematics	Undergraduate (low graders)	Theory	3	6	3	Major	The course is intended for the use and the application of Mathematical software, especially Mathematica. Our goal is to provide another aspect of the basic and advanced concepts in Mathematics through symbolic and computational mathematical software
Mathematics	MTH2012	Applied Differential Equations	Undergraduate (low graders)	Theory	3	6	3	Major	This course will be a continuation of ordinary differential equations. Topics include: Laplace transformations and its applications; total differential equations; partial differential equations of the first order; linear partial differential equations; linear higher order partial differential equations with constant coefficients.
Mathematics	MTH2013	Analysis	Undergraduate (low graders)	Theory	3	6	3	Major	This is a course to learn the structure of a proof and to be able to prove results by themselves. Topics cover: Real and complex number systems, basic topology, sequences and series, continuity and uniform continuity, differentiation and properties of differentiable functions etc.

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Mathematics	MTH2014	Modern Algebra	Undergraduate (low graders)	Theory	3	6	3	Major	This course will cover the following topics: Equivalence relations; concepts of group, subgroup, and cyclic group; Lagrange's theorem; Isomorphism theorems; Cayley's theorem; factor group; simple group; series of groups; group action and its applications; Sylow theorems and its applications.
Mathematics	MTH2015	Probability and Statistics	Undergraduate (low graders)	Theory	3	6	3	Major	Descriptive Statistics, elementary probability, random variables, probability models, sampling distribution, the central limit theorem, confidence intervals and one-sample tests based on normal, t and chi square with applications to various fields in science and engineering.
Mathematics	MTH2016	Matrix Theory	Undergraduate (low graders)	Theory	3	6	3	Major	Main course in Linear Algebra. This course will cover some theoretical aspects of the following topics; systems of linear equations and matrices, LU-factorization, rank-nullity theorem, matrix representation of linear transformations, change of basis and similarity, inner product spaces, orthogonal matrices and Gram-Schmidt process, least square solution, eigenvector and matrix diagonalization, Complex vector spaces, Schur's theorem, Jordan canonical forms, Cayley-Hamilton theorem etc.(prerequisite:2005082 Linear Algebra, or permission of Instructor etc.)
Mathematics	MTH2017	Complex Analysis	Undergraduate (low graders)	Theory	3	6	3	Major	This course will cover half of standard topics on functions of one complex variable. The main contents are complex number systems, elementary functions and their mapping properties, analytic functions, contour integration, Cauchy's theorem and its applications.
Mathematics	MTH2018	Introduction to Geometry	Undergraduate (low graders)	Theory	3	6	3	Major	In this course, we study foundation of Euclidean geometry and introduce other geometries, spherical geometry and non Euclidean geometry to make comparative study.
Mathematics	MTH3002	Numerical Analysis	Undergraduate (high graders)	Theory	3	6	3	Major	Numerical methods for solving Nonlinear equations, Systems of Simultaneous equations, Eigen value problems, Interpolating polynomials, Differentiations and Integrations, Ordinary Differential Equations, Partial Differential Equations will be treated.
Mathematics	MTH3007	Cryptology	Undergraduate (high graders)	Theory	3	6	3	Major	Secrete key cryptosystem and its application, basic notation of public key cryptosystem, RSA, EIGamal cryptosystem, discrete logarithm, knapsack problem, digital signature are studied

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Mathematics	MTH3008	Topics in Algebra	Undergraduate (high graders)	Theory	3	6	3	Major	This course will be a continuation of Algebra Ⅱ. Topics include: algebraic extensions; finite fields; splitting fields; separable extensions fields; Galois theory and its applications; cyclotomic extensions; solvable poly- nominal by radicals.
Mathematics	MTH3011	Partial Differential Equations	Undergraduate (high graders)	Theory	3	6	3	Major	fundamental theories of partial differential equations: first order equations, the Cauchy problem of the quasi-linear equations, second order equations, propagation of singularities, one dimensional wave equations, the Cauchy-Kowlevsky theorem Holmgren's theorem of uniqueness, Laplace equation, Green's function, maximum principle, Perron's method, Hilbert space method, higher order hyperbolic equation, symmetric hyperbolic system, heat equation, maximum principle for heat equation.
Mathematics	MTH3013	Topics in Analysis	Undergraduate (high graders)	Theory	3	6	3	Major	General Measure and Lebesgue Measure, Banach Spaces, Hilbert spaces, Metric spaces, Compact spaces.
Mathematics	MTH3015	Applied Numerical Analysis	Undergraduate (high graders)	Theory	3	6	3	Major	The theory and methodology of the numerical solution of partial differential equations and integral equations are presented. After constructing and exploring realistic mathematical models of problems arising in the natural sciences and engineering, we apply the theory and methods to obtain their solutions.
Mathematics	MTH3016	Real Variables	Undergraduate (high graders)	Theory	3	6	3	Major	Lebesgue Measure, The Lebesgue Integral, Differentiation and Integration, Measure and Integration, Measure and outer Measure.
Mathematics	MTH3019	Differential Geometry Ⅱ	Undergraduate (high graders)	Theory	3	6	3	Major	This course is a continuation of Differential Geometry Ⅰ and necessary for students willing to study Differential Topology, Global Analysis and Theoretical Physics for future study. In this course, Gaussian curvature, properties of geodesic on a surface are treated. Also we study Gauss-Bonnet Theorem which explains how the Gaussian curvature influences to the topology of a surface.
Mathematics	MTH3020	Mathematical Statistics Ⅰ	Undergraduate (high graders)	Theory	3	6	3	Major	Mathematical probability as a basis for the theory of statistics. Discrete and continuous probability models. Conditional probability and independence. Random variables. Central limit theorem. Sampling distribution.
Mathematics	MTH3021	Mathematical Statistics Ⅱ	Undergraduate (high graders)	Theory	3	6	3	Major	Point estimation. Confidence interval. Neyman-Pearson theory of testing of hypotheses. Sufficiency. Completeness Rao-Blackwellization. Some nonparametric methods. Linear models (Continuation of Mathematical Statistics I)

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Mathematics	MTH3022	Probability Theory	Undergraduate (high graders)	Theory	3	6	3	Major	Introduction to probability using techniques of measure and integration theory. Probability space. Densities. Fubini theorem. Convergence of random variables, Laws of large number for iid random variables. Central limit theorem for independent random variables.
Mathematics	MTH3023	Applied Mathematics	Undergraduate (high graders)	Theory	3	6	3	Major	Introduction to mathematical solutions of problems arising from natural sciences, biomedicine, engineering, and mathematical finance after studying basic parabolic PDE, integral transforms, and stochastic differential equations.
Mathematics	MTH3024	Differential Geometry	Undergraduate (high graders)	Theory	3	6	3	Major	For a surface in 3-dimensional Euclidean space, methods to calculation of Gaussian curvature and mean curvature of the surface are investigated and main geometric properties are explained in terms of the curvatures. Also we study intrinsic geometric properties from differential forms and structure equation on the surface.
Mathematics	MTH3025	General Topology	Undergraduate (high graders)	Theory	3	6	3	Major	A study of topological spaces and maps, including products, identifications and connectedness. A study of topological spaces and maps, including products, identifications and connectedness.
Mathematics	MTH3026	Combinatorics and Graph Theory	Undergraduate (high graders)	Theory	3	6	3	Major	This course will cover some of the fundamental theories and its applications. Topics include: classical techniques; Polya theory; Matching theory; Inversion techniques.
Mathematics	MTH3027	Modern Algebra2	Undergraduate (high graders)	Theory	3	6	3	Major	This course will be a continuation of Algebra. Topics include: rings and fields; integral domains; Fermat's theorem and Euler's theorem; field of quotients of an integral domains; ring of polynomials; factor rings and isomorphism theorems; prime ideals and maximal ideals; unique factorization domains; Euclidean domains; Gaussian integers and norms.
Mathematics	MTH3028	General Topology2	Undergraduate (high graders)	Theory	3	6	3	Major	A study of topological spaces and maps, including separations, compactness, uniform spaces and function spaces.
Mathematics	MTH3029	Complex Analysis2	Undergraduate (high graders)	Theory	3	6	3	Major	This course will be a continuation of complex analysis I. Laurent series, Residue theorem, conformal mapping and its applications to harmonic functions will be studied.

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Mathematics	MTH3030	History of Mathematics	Undergraduate (high graders)	Theory	3	6	3	Major	The three themes of this course are mathematics, history, and biography. We shall focus in particular on mathematics in the ancient Middle East, geometry and algebra in classical Greece, the preservation of the knowledge of antiquity outside of Europe in medieval times, progress in number theory and the solution of polynomial and Diophantine equations, and the development of differential and integral calculus in the seventeenth century. We study mathematics and the history.
Mathematics	MTH3031	Bachelor's Thesis Study	Undergraduate (high graders)	Independent Research	2	4	0	Major	By writing a thesis report under the supervision of advisors, students are required to enhance the practical ability to work independently in industries, educational and research institutions.
Mathematics	MTH4003	Theory of Numerical Analysis	Graduate (Bachelor/Master)	Theory	3	6	3	Major	Mathematical aspects of Numerical methods such as the numerical solution of differential equations, numerical linear algebra, and approximation theory. Furthermore, we deal with the multigrid method, procedure for multivariate interpolation, and homotopy methods.
Mathematics	MTH4010	Numerical Linear Algebra	Graduate (Bachelor/Master)	Theory	3	6	3	Major	Study theory and numerical method for maximal linear independence subsets, change of basis, the change of coordinate matrix, Theoretical and computational aspect of systems of linear equations, matrix limits, Invariant subspaces, Dual spaces, Normal and self-adjoint operators, Spectral theorem, Bilinear and Quadratic forms, Generalized eigenvectors, Jordan Canonical Forms, Minimal polynomial, functions of a matrix, spectral theorem, singular values, norms, field of values, inertia etc.
Mathematics	MTH4016	Math Co-op I	Graduate (Bachelor/Master)	Internship	1	2	0	Major	Field practice to utilize mathematical knowledge for the real world problems. (for 2 weeks)
Mathematics	MTH4017	Math Co-op II	Graduate (Bachelor/Master)	Internship	2	4	0	Major	Field practice to utilize mathematical knowledge for the real world problems. (for 4 weeks)
Mathematics	MTH4018	Math Co-op III	Graduate (Bachelor/Master)	Internship	3	6	0	Major	Field practice to utilize mathematical knowledge for the real world problems. (for 6 weeks)
Mathematics	MTH4019	Math Co-op IV	Graduate (Bachelor/Master)	Internship	4	8	0	Major	Field practice to utilize mathematical knowledge for the real world problems. (for 8 weeks)

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Mathematics	MTH4020	Financial Mathematics	Graduate (Bachelor/Master)	Theory	3	6	3	Major	1: This course is a graduate-level introduction to Portfolio Theory, Option Pricing, Risk Management, Fixed Income Markets, and Credit Risk Theory. 2: This course is also an introduction to Stochastic Differential Equations, Numerical Stochastic Differential Equations, and Stochastic Numerical Optimization.
Mathematics	MTH4023	Applications of Partial Differential Equations	Graduate (Bachelor/Master)	Theory	3	6	3	Major	foundations of the modern theories of partial differential equations: introduction, Hadamard's counter example, Laplace's equation, mean value theorem and its application, energy method, heat equation, wave equation, nonlinear first order equations, the Hamilton-Jacobi equation, representation of solutions, Fourier transform, hodograph transform, the Laplace method, analytic functions and the Cauchy-Lovalevsky theorem, theory of the Sobolev spaces, the Gagliardo-Nirenberg-Sobolev inequality, imbedding theorems, the Poincare inequality. We study deeper theories as well as more recent topics: harmonic analysis and its applications to PDE, theory of pseudo differential operators, micro local analysis, propagation of singularities, Bony's theory of pradifferential operators. wavelet theory and applications.
Mathematics	MTH4024	Probability and Statistics	Graduate (Bachelor/Master)	Theory	3	6	3	Major	Probability and Statistical methods are dealt with based on a sound understanding of mathematical statistics and mathematical tools. Probability Space, Random variables, Independence, Expectation, Convergence of random variables, Characteristic functions.
Mathematics	MTH4025	Real Analysis 1	Graduate (Bachelor/Master)	Theory	3	6	3	Major	Main subjects are the basic concepts of real analysis: uniform convergence, Riemann integration, Lebesgue measure, Lebesgue integral, differentiation of an integration, classical Banach spaces and convergence of the sequence of functions.
Mathematics	MTH4028	Introduction to Mathematical Modeling	Graduate (Bachelor/Master)	Theory	3	6	3	Major	The aim of the course is to develop and extend some of the theoretical ideas developed in the mainstream mathematics course and to show how they can be applied in simple modelling situations: the methods and models will be integrated so that techniques are illustrated or motivated by applications. Many of the mathematical techniques have been covered but the emphasis in this course is on the interplay between the mathematics and the applications.

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Mathematics	MTH4029	Actuarial Mathematics	Graduate (Bachelor/Master)	Theory	3	6	3	Major	This is a mathematical introduction to actuarial science. Topics include survival distributions and life tables, whole life insurance, term life insurance, endowment, life annuities. In addition, this course provides how to calculate net premiums and net premium reserves.
Mathematics	MTH4030	Advanced Algebra	Graduate (Bachelor/Master)	Theory	3	6	3	Major	This course is an continuation of Algebra 1 and Algebra 2, examining in depth selected topics from the theory of groups, rings, fields and algebras. Topics include some of field and Galois theory.
Mathematics	MTH4031	Topics in Advanced Algebra	Graduate (Bachelor/Master)	Theory	3	6	3	Major	This course is an in-depth study of various aspects of abstract algebra, building on the theory of groups, rings, fields and algebras, including Galois theory. Topics include some of the following: the structure of groups, rings, fields, and commutative rings and modules.
Mathematics	MTH5001	Research Course I	Graduate (Master/PhD)	Independent Research	3	0	0	Major	Independent study for the advanced research.
Mathematics	MTH5002	Research Course II	Graduate (Master/PhD)	Independent Research	3	0	0	Major	Independent study for the advanced research.
Mathematics	MTH5003	Research Course III	Graduate (Master/PhD)	Independent Research	3	0	0	Major	Independent study for the advanced research.
Mathematics	MTH5004	Research Course IV	Graduate (Master/PhD)	Independent Research	3	0	0	Major	Independent study for the advanced research.
Mathematics	MTH5028	Combinatorial Matrix Theory	Graduate (Master/PhD)	Theory	3	6	3	Major	This course devoted to the exposition of combinatorial matrix theory. This subject concerns itself with the use of matrix theory and linear algebra in proving results in combinatorics (and vice versa). We deal with the many connections between matrices, graphs, digraphs and bipartite graphs. The basic theory of network flows is developed in order to obtain existence theorems for matrices with prescribed combinatorial properties and to obtain various matrix decomposition theorems. Other chapters cover the permanent of a matrix, and Latin squares. The final chapter deals with algebraic characterizations of combinatorial properties and the use of combinatorial arguments in proving classical algebraic theorems, including the Cayley-Hamilton Theorem and the Jordan Canonical Form. It will be an essential purchase for combinatorialists, matrix theorists, and those numerical analysts working in numerical linear algebra.
Mathematics	MTH5045	Algebraic Topology	Graduate (Master/PhD)	Theory	3	6	3	Major	We study CW-complexes, relative homeomorphism theorem, cellular homology and basic cohomology.

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Mathematics	MTH5060	Nonlinear Functional Analysis	Graduate (Master/PhD)	Theory	3	6	3	Major	In Nonlinear Functional Analysis, main subjects are Monotone Operators, Implicit Functions and Problems at Resonance, Solutions in Cones, Approximate Solutions, Extremal Problems and Bifurcation Theory.
Mathematics	MTH5073	Analysis Seminar	Graduate (Master/PhD)	Theory	3	6	3	Major	Recent articles and selected topics in Analysis, Nonlinear Analysis and Numerical Analysis are presented for graduate students and post doctoral researchers.
Mathematics	MTH5082	Metric Geometry	Graduate (Master/PhD)	Theory	3	6	3	Major	In metric geometry, spaces which are determined by distance and angle are studied. Relations between curvatures, area, volumes and other geometric properties are studied.
Mathematics	MTH5094	Advanced Applied Mathematics	Graduate (Master/PhD)	Theory	3	6	3	Major	This is a graduate-level applied mathematics course and introduction to Stochastic Calculus, Stochastic Differential Equations, and Numerical Stochastic Optimization including stochastic numerical methods and applications drawn from Mathematical finance and Biomedicine.
Mathematics	MTH5095	Advanced Partial Differential Equations	Graduate (Master/PhD)	Theory	3	6	3	Major	This course is a continuation of the Applications of partial differential equations. Various subjects, techniques and recent developments for the partial differential equations are covered, for example, the energy method, variational method, conservation laws, fixed point theorems and etc.
Mathematics	MTH5096	Topics in Advanced Analysis	Graduate (Master/PhD)	Theory	3	6	3	Major	Various mathematical questions that arose in Analysis and its related areas, focused on further information on recent main topics. Advanced topics in Analysis are covered.
Mathematics	MTH5098	Seminar in Geometry	Graduate (Master/PhD)	Theory	3	6	3	Major	A specified research topics in differential geometry will be studied in detail.
Mathematics	MTH5099	Topics in Geometry	Graduate (Master/PhD)	Theory	3	6	3	Major	Background materials for research in differential geometry will be presented. Geometric properties and methods coming from other area of mathematics or physics will be studied. We follow the research topics closely, and study a specified research topic in detail.
Mathematics	MTH5101	Seminar in Algebraic and Geometric Modelling	Graduate (Master/PhD)	Theory	3	6	3	Major	By using selected topics in algebra and geometry, we formulate mathematical models of real life.

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Mathematics	MTH5103	Algebraic Graph Theory	Graduate (Master/PhD)	Theory	3	6	3	Major	Fundamentals of combinatorics, recurrence relations, generating functions combinatorial algorithms, Latin squares, mutually orthogonal Latin squares, orthogonal and perpendicular arrays, Steiner triple systems, Fundamental concepts of graph theory, connectivity, block designs, difference sets and finite geometries, Hamiltonian and Eulerian graphs, matchings, edge-colorings, vertex-colorings and scheduling problems, Hamiltonian cycles and Euler tours, spanning trees, disjoint paths and reliable networks, directed graphs, extremal graph theory, planar graph etc.
Mathematics	MTH5104	Algebra Seminar	Graduate (Master/PhD)	Theory	3	6	3	Major	Presentation of selected topics in Algebra.
Mathematics	MTH5105	Theory of Riemannian manifolds	Graduate (Master/PhD)	Theory	3	6	3	Major	We study local and global properties of Riemannian manifolds. Geometry of surfaces in Euclidean space and basic properties of Riemannian curvature tensor are studied. Global properties of Riemannian manifolds are examined under several curvature conditions. Basic geometric comparison and manifolds of constant curvature are discussed.
Mathematics	MTH5109	Numerical Stochastic Optimization	Graduate (Master/PhD)	Theory	3	6	3	Major	Theory of optimization: use of numerical and stochastic algorithms in solutions of optimization problems; linear and nonlinear Programming, sensitivity analysis, convexity, optimal control theory, dynamic Programming, and calculus of variations.
Mathematics	MTH5114	Topics in Applied Mathematics	Graduate (Master/PhD)	Theory	3	6	3	Major	1: We study the numerical solutions of Mathematical and Stochastic models in Financial Engineering, Biomedical Projects, and Engineering, consisting of systems of Integro-partial Differential Equations. 2: Various topics of applied mathematics.

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Mathematics	MTH5117	Functional Analysis	Graduate (Master/PhD)	Theory	3	6	3	Major	Basic concepts, principles and methods of Functional Analysis and its Applications: Hahn-Banach theorem, Riesz Representation Theorem for Hilbert Spaces, Compact Self-Adjoint Operators, Locally Convex Spaces and Weak Topologies. Spectral Theory for various Operators; Banach Algebras, C* -Algebras, Spectral Theory of a Compact Operator, Normal Operators on Hilbert space, Unbounded Operators and Fredholm Operators.
Mathematics	MTH5124	Advanced Cryptography	Graduate (Master/PhD)	Theory	3	6	3	Major	Communication and information security are increasingly important due to the recent development of internet and computer based society. Cryptography gives a way of realizing secure communication of various information. In this course, we cover the basic secret and public key algorithms such as AES and RSA. We also study more advance topics such as Elliptic Curve Cryptography, Torus Based Cryptography, and Pairing Based Cryptography.
Mathematics	MTH5126	Advanced Financial Mathematics	Graduate (Master/PhD)	Theory	3	6	3	Major	This is the graduate-level follow-up course for Mathematical Finance which covers the material including exotic options, American derivative securities, change of measure, term-structure models and jump processes.
Mathematics	MTH5128	Dynamical System	Graduate (Master/PhD)	Theory	3	6	3	Major	In most of the cases, it is impossible to derive explicit solution formula for a system of differential equations. Therefore, we should study them either theoretically or numerically. This course is on the theoretical investigation of the behavior of solutions for systems of ordinary differential equations. More precisely, we cover topics such as the stability/instability issues and asymptotic behaviors of solutions, qualitative properties of orbits, Poincare Bendixon theorem, Invariant manifold, bifurcation theory and chaos theory.
Mathematics	MTH5129	Representation Theory of Groups	Graduate (Master/PhD)	Theory	3	6	3	Major	Representation theory is a branch of modern mathematics, which studies an algebraic structure by representing it in terms of linear transformations or matrices. It provides a powerful method in various areas in mathematics or mathematical physics. In this course, we introduce classical results on representations of a finite group over the complex numbers. The main goal is to prove the classification of complex irreducible modules over a finite group and orthonormality of irreducible characters. Furthermore, we introduce a general theory on representations of a finite dimensional algebra.

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Mathematics	MTH5130	Machine Learning for Big Data	Graduate (Master/PhD)	Theory	3	6	3	Major	In this course, we will cover the basic theory, algorithms, and applications in the mathematical as well as the heuristic view. In particular, we will study the challenges related to data sets with massive size and dimension by canonical examples of big data applications in science and industry. We will also study the computational aspects of these challenges in the context of parallel architectures.
Mathematics	MTH5134	Algebraic Number Theory	Graduate (Master/PhD)	Theory	3	6	3	Major	In this course we study arithmetic properties of number fields, which are defined as finite extension fields of the rational number field. We investigate the structure of ring of algebraic integers in a given number field, and define class numbers, which measure how far the ring is f away from the unique factorization domain. We also study basic theorems in algebraic number theory, such as finiteness of class numbers, Dirichlet's unit theorem, decomposition of primes in number fields, decomposition of primes in Galois extensions and analytic class number formula, etc.. Two important examples of number fields are quadratic fields and cyclotomic fields. We introduce their Dedekind zeta functions and develop their analytic properties to derive explicit class number formulas of such fields. We also provide a lot of theorems and conjectures in relation to their class numbers.
Mathematics	MTH5137	Topics in Industrial Mathematics	Graduate (Master/PhD)	Theory	3	6	3	Major	Industrial mathematics is a branch of the applied mathematics. But rather than building up theories and techniques, it concentrates on providing solutions to various problems arising in the industry. Due to the variety of problems in the industry, it is inherently interdisciplinary and basically all branches of mathematics - from pure to applied - are employed, and in many cases new techniques has to be developed to overcome difficulties in the industry. In this course, we study basic techniques and theories frequently used in the resolution of industrial problems. More precisely, we cover topics such as the theoretical understanding and numerical simulations of partial differential equations, mathematical modeling, financial mathematics and scientific computing.