	Course Title	Course Instructor	Course Text	Course Description and Main Content	Course Grade
1	Geometry	Xiang Ma	*Analytic Geometry* by Chengye You	Analytic geometry in R^3 including quadratic curves and quadratic surfaces, basic projective geometry	88
2	Mathematical Analysis(I)	Jiazhong Yang	*Mathematical Analysis (Volume One)* by Shengjian Wu	Set of real numbers, sequence and limit, continuity, differential and indefinite integral	93.5
3	Advanced Algebra I (Honor)	Jinpeng An	*Linear Algebra (2nd Edition)* by K. Hoffman and R. Kunze	Linear space, linear maps, dual space, and determinants of linear maps	94
4	Mathematical Analysis(II)	Jiazhong Yang	*Mathematical Analysis (Volume Two)* by Shengjian Wu	Riemann integral, improper integral, number series, function sequence and function series, power series, Fourier series	92
5	Advanced Algebra II (Honor)	Jinpeng An	*Linear Algebra (2nd Edition)* by K. Hoffman and R. Kunze	Characteristic values, invariant subspaces, Jordan forms, inner product spaces and bilinear forms	93
6	Probability Theory	Yanxia Ren	*Introduction to Probability Theory* by Xianping Li	Event and sample space, probability, random variables and distributions, characteristic functions, and an introduction to law of large numbers and central limit theorem	91
7	Mathematical Analysis(III)	Baoxiang Wang	*Mathematical Analysis (Volume Three)* by Shengjian Wu	Riemann integral, improper integral, number series, function sequence and function series, power series, Fourier series	94
8	Algebra(I) (Honor)	Liang Xiao	*Abstract Algebra* by D. Dummit, R. Foote	Definitions and properties of groups, rings, modules, fields, and Galois theory	96
9	Functions of Real Variables	Shiwu Yang	*Real Analysis* by Stein	Basic set theory, Lebesgue measure, measurable functions, Lebesgue integral, differential and integral revisit, and L^{p} spaces	96
10	Ordinary Differential Equations	Weigu Li	*Ordinary Differential Equations* by Bin Liu	Methodsto solve ODE and systems of linear ODE, the existence and uniqueness of solution, the influence of initial value and parameters on the solution, topics with respect to boundary values	97
11	Theory of Functions of a Complex Variable (Honor)	Hanlong Fang	*Complex Analysis* by Stein	Holomorphic functions (Cauchy's integral theorem and related topics, Laurent series, residue), conformal mapping, and proof of prime theorem	95
12	Functional Analysis	Zhifei Zhang	*Lecture Notes on Functional Analysis (Volume One)* by Gongqing Zhang and Yuanqu Lin	Metric spaces, linear operators and linear forms, compact operators and Fredholm operators (basic category theory, derived functors)	99
13	Algebra II (Honor)	Enlin Yang	*Commutative Algebra* by M. F. Atiyah, I. G. MacDonald, *Introduction to Homological Algebra* by Charles A. Weibel	Introduce commutative algebra (covering Atiyah's book), and homological algebra	94
14	Mathematical Modeling	Zhennan Zhou	*Methods of Mathematical Modelling --Continuous Systems and Differential Equation* by T. Witelski and M. Bowen	An introduction to mathematical modelling using ordinary and partial differential equations.	89
15	Algebraic Geometry I (Graduate)	Zhiyu Tian	*Algebraic Geometry* by R. Hartshorne	An introduction to the theory of schemes and cohomology, covering part of Chapter 2 and Chapter 3 of GTM52.	88
16	Homology Theory (Graduate)	Houhong Fan	*Homology* by Boju Jiang, *Algebraic Topology* by Allen Hatcher	Homology and cohomology theory, covering simplicial homology, CM complexes, and Poincare duality	P (due to COVID-19)
17	Topology	Wenyuan Yang	*Topology* by J.R.Munkres, *Lecture Notes on Foundations of Topology* by Chengye You	Topological space and continuity, topological properties, quotient space and closed surfaces, homotopy and fundamental group, covering space	94
18	Differential Manifolds and Topology (Honor)	Yi Liu	*An Introduction to Differential Manifold* by Huanwei Chen	Introduction to differential manifolds and vector space, Whitney theorem, Stocks formula, de Rham cohomology and its relationship with singular homology and intersection number.	93
19	Basic Theory of Numbers	Jun Yu	*Primes of the Form x2+ny2: Fermat, Class Field Theory, and Complex Multiplication* by David A. Cox	The work of Lagrange, Legendre and Gauss on quadratic reciprocity and the genus theory of quadratic forms, basic algebraic number theory and class field theory.	86

20	Modular Form and Number Theory (Graduate)	Jun Yu	*Introduction to Modular Forms* by Wenwei Li	Modular curves with level structures, modular forms, Hecke operators, and L-functions	95
21	Lie Groups and Lie Algebras (Graduate)	Xiaomeng Xu	*Lie Groups, Lie Algebras, and Representations, Lie Groups Beyond an Introduction*	Introduce the machinery of roots, weights and the Weyl group in the representation of Lie algebra, structure theory of semisimple Lie algebras, and construction of the representations of compact Lie	90
22	Fiber Bundles and Characteristic Classes (Graduate)	Zhiqiang Bao	*Characteristic Classes* by Milnor	Introduction to characteristic classes, with detailed studies of Stiefel-Whitney classes, Chern classes, Pontrjagin classes, and the Euler class.	96
23	Algebraic Geometry II (Graduate)	Zhiyu Tian	*Algebraic Geometry* by R. Hartshorne	An introduction to the theory of schemes and cohomology, covering Serre duality, cohomology and base change, theorem on formal functions, basics of algebraic curves and surfaces.	93.5
24	Introduction to Differentiable Manifolds	Bo Dai	*Introduction to Manifolds and Geometry* by Jiaqiang Mei	Differentiable manifolds, differential forms, and connection	97
The following are in-progress math courses					
25	Number Theory I (Graduate)	Xinyi Yuan	*Algebraic Number Theory* by J. Neukirch	Number fields, rings of algebraic Integers, local fields and class field theory	
26	Topics in Number Theory (Graduate)	Enlin Yang	*SGA 4 1/2*	Etale cohomology, including cohomology of curves, the smooth and proper base change theorems, Poincaré duality, and proof of Weil conjecture	
27	Topics in Representation Theory (Graduate)	Wenwei Li	*Automorphic Forms and Representations* by Daniel Bump	Introduction to automorphic forms	
28	Partial Differential Equations	Zhifei Zhang	*Partial Differential Equations: An Introduction* by Walter A. Strauss	Laplace equations, heat equations, wave equations	