(For students admitted in 2012-13 under the 4-year degree)

BSc in Mathematics

In addition to the requirements of their major programs, students are required to complete the University and School requirements for graduation. For details please refer to the respective sections on this website.

Major Requirements

			Credit(s)
Students MUST take the following courses prior to enrollment into the major			
Major Pre-requisite course(s)			
MATH		Note: [(MATH 1013 OR MATH 1023) AND (MATH 1014 OR MATH 1024)] OR [MATH 1020]	4-6
MATH	1013	Calculus I	3
MATH	1014	Calculus II	3
MATH	1020	Accelerated Calculus	4
MATH	1023	Honors Calculus I	3
MATH	1024	Honors Calculus II	3

Required Course(s)

MATH	2023	Multivariable Calculus	4
MATH		Note: MATH 2033 OR MATH 2043 [Students following Pure Mathematics (Advanced) Track can only use MATH 2043 to fulfill the requirement.]	4
MATH	2033	Mathematical Analysis	4
MATH	2043	Honors Mathematical Analysis	4
MATH		Note: MATH 2121 OR MATH 2131 [Students following Pure Mathematics (Advanced) Track can only use MATH 2131 to fulfill the requirement.]	4
MATH	2121	Linear Algebra	4
MATH	2131	Honors in Linear and Abstract Algebra I	4
MATH		Note: MATH 3033 OR MATH 3043 [Students following Pure Mathematics (Advanced) Track can only use MATH 3043 to fulfill the requirement.]	4
MATH	3033	Real Analysis	4
MATH	3043	Honors Real Analysis	4
MATH	4999	Capstone Project	3
COMP		Note: COMP 1021 OR COMP 1022P OR COMP 1022Q	3
COMP	1021	Introduction to Computer Science	3
COMP	1022P	Introduction to Computing with Java	3
COMP	1022Q	Introduction to Computing with Excel VBA	3
LANG	3011	English for Mathematics	3

Track Study

Students should follow one of the tracks and complete all requirements as specified

Applied Mathematics Track

Required Course(s)

MATH	2352	Differential Equations	4
MATH	2411	Applied Statistics	4
MATH	3312	Numerical Analysis	3

Elective Course(s)

MATH		MATH Depth Electives (4 courses from the specified elective list)	12
MATH	3425	Stochastic Modeling	3
MATH	4023	Complex Analysis	3
MATH	4051	Theory of Ordinary Differential Equations	3
MATH	4052	Partial Differential Equations	3
MATH	4321	Game Theory	3
MATH	4326	Introduction to Fluid Dynamics	3
MATH	4333	Mathematical Biology	3
MATH	4335	Introduction to Optimization	3
MATH	4336	Introduction to Mathematics of Image Processing	3
MATH	4351	Numerical Solutions of Partial Differential Equations	3
MATH	4511	Quantitative Methods for Fixed Income Derivatives	3
MATH	4512	Fundamentals of Mathematical Finance	3
MATH	4823	Special Topics in Applied Mathematics	1-4

Computer Science Track

Required Course(s)

MATH	2343	Discrete Structures	4
MATH	3121	Algebra I	3
COMP		Note: (COMP 2011 AND COMP 2012) OR COMP 2012H	5-8
COMP	2011	Introduction to Object-oriented Programming	4
COMP	2012	Object-Oriented Programming and Data Structures	4
COMP	2012H	OOP and Data Structures (Honors Study Track)**	4**
COMP	2611	Computer Organization	4
COMP		Note: COMP 3711 OR COMP 3711H	3-4
COMP	3711	Design and Analysis of Algorithms	3
COMP	3711H	Honors Design and Analysis of Algorithms	4

Elective Course(s)

MATH		MATH 3000-level or above Elective (Any 1 course of the subject and level as specified)	3
MATH		(For students opting COMP 2012H only) MATH 2000-level or above Elective (Any 1 course of the subject and level as specified)	0-3

MATH		MATH Electives (2 courses from the specified elective list)	6
MATH	2421	Probability	4
MATH	3312	Numerical Analysis	3
MATH	3343	Combinatorial Analysis	3
MATH	3423	Statistical Inference	3
MATH	4023	Complex Analysis	3
MATH	4141	Number Theory and Applications	3
MATH	4223	Differential Geometry	3
MATH	4321	Game Theory	3
COMP		COMP 4000-level or above Elective (Any 1 course of the subject and level as specified)	3
COMP		COMP Elective (1 course from the specified elective list)	3
COMP	3031	Principles of Programming Languages	3
COMP	3111	Software Engineering	4
COMP	3111H	Honors Software Engineering	4
COMP	3211	Fundamentals of Artificial Intelligence	3
COMP	3311	Database Management Systems	3
COMP	3511	Operating Systems	3

Mathematics and Physics Track

Required Course(s)

MATH	2352	Differential Equations	4
MATH	3312	Numerical Analysis	3
MATH	4023	Complex Analysis	3
MATH	4052	Partial Differential Equations	3
PHYS		Note: PHYS 1111 OR PHYS 1112 OR PHYS 1151 OR PHYS 1152 OR PHYS 1312	2-3
PHYS	1111	General Physics I	3
PHYS	1112	General Physics I with Calculus	3
PHYS	1151	Accelerated General Physics I	2
PHYS	1152	Accelerated General Physics I with Calculus	2
PHYS	1312	Honors General Physics I	3
PHYS	1113	Laboratory for General Physics I	1
PHYS		Note: PHYS 1114 OR PHYS 1154 OR PHYS 1314	2-3
PHYS	1114	General Physics II	3
PHYS	1154	Accelerated General Physics II	2
PHYS	1314	Honors General Physics II	3
PHYS	1115	Laboratory for General Physics II	1
PHYS	2022	Modern Physics	3
PHYS	2023	Modern Physics Laboratory	1
PHYS	3032	Classical Mechanics	3
PHYS		Note: PHYS 3033 OR PHYS 3053	3-4
PHYS	3033	Electricity and Magnetism I	3

PHYS	3053	Honors Electricity and Magnetism I	4
PHYS		Note: PHYS 3034 OR PHYS 4051 OR PHYS 4052	3
PHYS	3034	Electricity and Magnetism II	3
PHYS	4051	Quantum Mechanics II	3
PHYS	4052	Introductory Solid State Physics	3
PHYS		Note: PHYS 3036 OR PHYS 3037	3-4
PHYS	3036	Quantum Mechanics I	3
PHYS	3037	Honors Quantum Mechanics I	4
PHYS	4050	Thermodynamics and Statistical Physics	3
Elective Course(s)			
MATH/PHYS		MATH/PHYS 3000-level or above Elective (Any 1 course of the subject and level as specified)	3

Pure Mathematics (Advanced) Track

Students in the Pure Mathematics (Advanced) Track should also take MATH 2043, MATH 2131, and MATH 3043 as specified in the major requirements.

Required Course(s)			
MATH	3131	Honors in Linear and Abstract Algebra II	4
MATH	4033	Calculus on Manifolds	3
MATH	4225	Topology	3
Elective Course(s)			
MATH		MATH Depth Electives (4 courses from the specified elective list, of which at least 1 course from each area in Algebra / Analysis / Geometry)	12
Algebra			
MATH	4141	Number Theory and Applications	3
MATH	4151	Introduction to Lie Groups	3
Analysis			
MATH	4023	Complex Analysis	3
MATH	4051	Theory of Ordinary Differential Equations	3
MATH	4052	Partial Differential Equations	3
Geometry			
MATH	4221	Euclidean and Non-Euclidean Geometries	3
MATH	4223	Differential Geometry	3
MATH		MATH 3000-level or above Elective (Any 1 course of the subject and level as specified)	3
MATH		Applied Mathematics or Statistics Elective (1 course from the specified elective list)	3-4
MATH	2343	Discrete Structures	4
MATH	2352	Differential Equations	4
MATH	2411	Applied Statistics	4

MATH	2421	Probability	4
MATH	3312	Numerical Analysis	3
MATH	3343	Combinatorial Analysis	3
MATH	4321	Game Theory	3
MATH	4326	Introduction to Fluid Dynamics	3

Pure Mathematics Track

Required Course(s)

MATH	3121	Algebra I	3
MATH	4225	Topology	3

Elective Course(s)

MATH		MATH 2000-level or above Electives (Any 2 courses of the subject and level as specified)	6
MATH		Applied Mathematics or Statistics Elective (1 course from the specified elective list)	3-4
MATH	2343	Discrete Structures	4
MATH	2352	Differential Equations	4
MATH	2411	Applied Statistics	4
MATH	2421	Probability	4
MATH	3312	Numerical Analysis	3
MATH	3343	Combinatorial Analysis	3
MATH	4321	Game Theory	3
MATH	4326	Introduction to Fluid Dynamics	3
MATH		Analysis Depth Elective (1 course from the specified elective list)	3
MATH	4023	Complex Analysis	3
MATH	4033	Calculus on Manifolds	3
MATH	4051	Theory of Ordinary Differential Equations	3
MATH	4052	Partial Differential Equations	3
MATH		Algebra Depth Elective (1 course from the specified elective list)	3
MATH	4121	Algebra II	3
MATH	4141	Number Theory and Applications	3
MATH	4151	Introduction to Lie Groups	3
MATH		Geometry Depth Elective (1 course from the specified elective list)	3
MATH	4221	Euclidean and Non-Euclidean Geometries	3
MATH	4223	Differential Geometry	3

Statistics and Financial Mathematics Track

Required Course(s)

MATH	2411	Applied Statistics	4
MATH	2421	Probability	4
MATH	3423	Statistical Inference	3
MATH	3424	Regression Analysis	3
MATH	4422	Data Analysis	3
MATH	4511	Quantitative Methods for Fixed Income Derivatives	3

MATH	4512	Fundamentals of Mathematical Finance	3
FINA	3104	Investment Analysis and Portfolio Management	4

Elective Course(s)

MATH		Pure or Applied Mathematics Elective (1 course from the specified elective list)		3
MATH	2352	Differential Equations	4	
MATH	3312	Numerical Analysis	3	
MATH	3343	Combinatorial Analysis	3	
MATH	4023	Complex Analysis	3	
MATH	4052	Partial Differential Equations	3	
MATH/RMBI		MATH/RMBI Depth Electives (2 courses from the specified elective list)		6
MATH	3425	Stochastic Modeling	3	
MATH	3426	Sampling	3	
MATH	4423	Nonparametric Statistics	3	
MATH	4424	Multivariate Analysis	3	
MATH	4425	Introductory Time Series	3	
MATH	4426	Survival Analysis	3	
RMBI	4210	Quantitative Methods for Risk Management	3	

***Remarks on course(s):*

-	COMP 2012H:	The course title will be changed to "Honors Object-Oriented Programming and Data Structures" starting from Fall, 2014-15.
-	COMP 2012H:	The credit value will be changed to 5 starting from Fall, 2014-15.