NUS National University of Singapore | Department of Mathematics Faculty of Science

B.Sc. & B.Sc. (Hons) with Major in Applied Mathematics

Graduation Requirements for students admitted in AY2015/16

To be awarded a **B.Sc. or B.Sc.(Hons) with primary major in Applied Mathematics**, in addition to the University and Faculty requirements, a candidate must satisfy the following:

Module Level	Major Requirements	Level MCs	Cumulative Major MCs
1000	1. Pass the 4 modules in List I 2. Pass CS1010/CS1010E/CS1010S/CS1010FC Programming Methodology	20	20
2000	3. Pass all the following modules: • MA2101/MA2101S Linear Algebra II • MA2108/MA2108S Mathematical Analysis I • MA2213 Numerical Analysis I • MA2216/ST2131 Probability 4. Pass one additional module from List II, III, IV	20-23	40-43
3000	5. Pass all the following modules: • MA3110/MA3110S Mathematical Analysis II • MA3111/MA3111S Complex Analysis I 6. Pass two modules from List AM3 7. Pass two additional modules from List III, IV	24-27*	64-70*
4000	8. Pass MA4199 Honours Project in Mathematics 9. Pass four modules from List AM4 10. Pass two additional modules from List IV	36-37*	100-106*
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Mathematics		

To be awarded a **B.Sc.(Hons.) with primary major in Applied Mathematics with Specialisation in Mathematical Modelling and Data Analytics**, in addition to the University and Faculty requirements, a candidate must satisfy the following:

Module Level	Major Requirements	Level MCs	Cumulative Major MCs
1000	1. Pass the 4 modules in List I 2. Pass CS1010/CS1010E/CS1010S/CS1010FC Programming Methodology	20	20
2000	3. Pass all the following modules: • MA2101/MA2101S Linear Algebra II • MA2108/MA2108S Mathematical Analysis I • MA2213 Numerical Analysis I • MA2216/ST2131 Probability 4. Pass one additional module from List II, III, IV	20-23	40-43
3000	5. Pass all the following modules: • MA3110/MA3110S Mathematical Analysis II • MA3111/MA3111S Complex Analysis I 6. Pass two modules from List AM3-MMDA 7. Pass two additional modules from List III, IV	24-27*	64-70*
4000	8. Pass MA4199 Honours Project in Mathematics 9. Pass four modules from List AM4-MMDA 10. Pass two additional modules from List IV	36-37*	100-106*
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Mathematics		

To be awarded a **B.Sc.(Hons.) with primary major in Applied Mathematics with Specialisation in Operations Research and Financial Mathematics**, in addition to the University and Faculty requirements, a candidate must satisfy the following:

Module Level	Major Requirements	Level MCs	Cumulative Major MCs
1000	1. Pass the 4 modules in List I 2. Pass CS1010/CS1010E/CS1010S/CS1010FC Programming Methodology	20	20
2000	3. Pass all the following modules: • MA2101/MA2101S Linear Algebra II • MA2108/MA2108S Mathematical Analysis I • MA2213 Numerical Analysis I • MA2216/ST2131 Probability 4. Pass one additional module from List II, III, IV	20-23	40-43
3000	5. Pass all the following modules: • MA3110/MA3110S Mathematical Analysis II • MA3111/MA3111S Complex Analysis I 6. Pass two modules from List AM3-ORFM 7. Pass two additional modules from List III, IV	24-27*	64-70*
4000	8. Pass MA4199 Honours Project in Mathematics 9. Pass four modules from List AM4-ORFM 10. Pass two additional modules from List IV	36-37*	100-106*
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Mathematics		

List I
• MA1100 Fundamental Concepts of Mathematics or CS1231 Discrete Structures • MA1101R Linear Algebra I • MA1102R Calculus • MA1104 Multivariable Calculus
List II
• All MA modules at level 2000, except those coded MA23XX • PC2130 Quantum Mechanics I • PC2132 Classical Mechanics • ST2132 Mathematical Statistics

List III

- All MA modules at level 3000, except MA3311 and MA3312
- CS3230 Design & Analysis of Algorithms
- CS3234 Logic and Formal Systems
- CS4232 Theory of Computation
- EC3101 Microeconomic Analysis II
- EC3303 Econometrics I
- PC3130 Quantum Mechanics II
- PC3236 Computational Methods in Physics
- PC3238 Fluid Dynamics
- ST3131 Regression Analysis
- ST3236 Stochastic Processes I

List IV

- All MA modules at level 4000 or higher
- CS4236 Cryptography Theory and Practice
- CS5230 Computational Complexity
- CS5237 Computational Geometry and Applications
- EC4301 Microeconomics Analysis III
- EC5104 Mathematical Economics
- PC4248 Relativity
- PC4274 Mathematical Methods in Physics III
- ST4238 Stochastic Processes II
- ST4245 Statistical Methods for Finance

List AM3

List AM3 consists of the following 3 baskets AM3-General, AM3-MMDA, AM3-ORFM.

AM3-General

- MA3209 Mathematical Analysis III
- MA3218 Applied Algebra
- MA3220 Ordinary Differential Equations

AM3-MMDA

- MA3227 Numerical Analysis II
- MA3233 Combinatorics and Graph II
- MA3264 Mathematical Modelling
- ST3131 Regression Analysis

AM3-ORFM

- MA3236 Nonlinear Programming
- MA3252 Linear and Network Optimization
- MA3269 Mathematical Finance I
- ST3131 Regression Analysis

List AM4
List AM4 consists of the following 3 baskets AM4-General, AM4-MMDA, AM4-ORFM.
AM4-General
• MA4211 Functional Analysis • MA4221 Partial Differential Equations • MA4235 Topics in Graph Theory • MA4261 Coding and Cryptography
AM4-MMDA
• MA4229 Approximation Theory • MA4230 Matrix Computation • MA4255 Numerical Methods in Differential Equations • MA4268 Mathematics for Visual Data Processing • MA4270 Data Modelling and Computation • MA4272 Mathematical Tools for Data Science
AM4-ORFM
• MA4254 Discrete Optimization • MA4260 Stochastic Operations Research • MA4264 Game Theory • MA4269 Mathematical Finance II • ST4245 Statistical Methods for Finance

Modular Credit Cumulative Table		
Requirements	**B.Sc.**	**B.Sc. (Hons)**
University Requirements	20 MC	20 MC
Faculty Requirements	4-8** MC	4-12** MC
Major Requirements	64-70* MC	100-106* MC
Unrestricted Free Electives	32-18*MC	36-18*MC
Total	**120 MC**	**160 MC**

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