

BSc (Hons) Mathematics with Computer Science – SCE321

1. Objectives

The BSc (Hons) Mathematics with Computer Science course is an innovative programme of study which has been redesigned for students who wish to acquire knowledge in both Mathematics and Computer Science. With increasing dependence on computations in the scientific and business worlds, this course provides the skills required for undertaking careers in Mathematics, business analytics and software development.

It is indeed a programme of study that provides the students with a firm and comprehensive knowledge in computer and mathematical sciences for them to be able to work as mathematicians in professions requiring the application of mathematical tools in modern science, engineering and finance. Various sectors of industry face increasingly large-scale problems that can be solved only through specialised knowledge and skills in applied mathematics together with the knowledge of computer science.

The objectives are:

- to help students build, develop and apply mathematical models using advanced IT tools so as to solve theoretical and practical mathematical problems in industry.
- to deepen their knowledge of current research in mathematics and informatics so as to enable them to continue their education at a postgraduate level.
- to prepare graduates for employment in application areas that require substantial input from both disciplines.

2. General Entry Requirements

As per General Entry Requirements for admission to the University for undergraduate degrees.

3. Programme Requirement

Minimum Grade 'C' in Mathematics at GCE 'A' level or an equivalent.

4. Programme Duration

	Normal	Maximum
Degree:	3 years	5 years

5. Credits per Year

Minimum: 18 credits; Maximum (including retake modules): 48 credits

6. Minimum Credits Required for Award of Undergraduate Degree: 100

Breakdown as follows:

Degree	Credits from		
	Core Taught Modules	Project	Electives
BSc (Hons) Mathematics with Computer Science	78	7	15 ^{ab}

^a at least 6 credits from level/year 2.

^b at least 9 credits from level/year 3.

7. Assessment

Each module will be assessed over 100 marks, which includes a written examination of 2- hour duration for modules carrying three credits, unless specified otherwise, and a 3- hour paper for modules carrying six credits, and continuous assessment done during the semester or year.

Written examinations accounting for 75%, will be carried out at the end of the semester in which they are taught.

The continuous assessment will count for 25% of the overall percentage mark of the module(s), except for a module where the structure makes for other specific provision(s). Continuous assessment may be based on practical work, presentations, seminars and/or assignments and should include at least 1 class test.

WCS 2200(3) will be 100 % coursework based on assignments and presentations.

An overall total of 40% is required for a candidate to pass a module.

Projects/Dissertations will carry 7 credits for degree award.

The following list of modules will be assessed solely by continuous assessment:

MA1117(1)

MA1214(1)

MA3010(5)

8. Submission Deadlines for dissertations

As per UoM regulations.

9. Exit Points

The different exit points for the programme are as per UoM regulations.

10. List of Modules

A. Core Modules (75 + 7 Credits)

Code	Module Name	Hrs/Wk	Credits
		L+P	
MA1111(1)	Mathematical Techniques I	3+0	3
MA1112(1)	Mathematical Analysis I	3+0	3
MA1113(1)	Applied Mathematics I	3+0	3
MA1115(1)	Probability & Statistics	3+0	3
MA1117(1)	Excel Modelling	2+2	3
CSE1031Y(1)	Database Systems & Administration	2+2	6
CSE1038Y(1)	Programming and Data Structures	2+2	6
MA1211(1)	Mathematical Techniques II	3+0	3
MA1212(1)	Mathematical Analysis II	3+0	3
MA1205(1)	Algebra for Computer Science	3+0	3
MA2111(3)	Numerical Analysis I	3+0	3
MA2112(3)	Mathematical Methods I	3+0	3
MA2113(3)	Mathematical Statistics	3+0	3
MA2104(3)	Complex Analysis	3+0	3
MA2118(3)	Linear Algebra	3+0	3
CSE2019Y(3)	Algorithms and Complexities	2+2	6
MA2202(3)	Linear Programming	3+0	3
MA2204(3)	Numerical Analysis II	3+0	3
WCS 2200(3)	Writing Case Studies	*	3
MA3000Y(5)	Project	-	7
MA3101(5)	Measure & Integral	3+0	3
CSE3053Y(5)	Computer Networks and System Administration	2+2	6
CSE3096Y(5)	Cloud Computing and Big Data	2+2	6
MA3201(5)	Applied Probability	3+0	3

* 9 Hours of Lectures and 36 Hours Self Study

B. Electives (Not all modules may be on offer)

Code	Module Name	Hrs/Wk	Credits
		L+P	
MA1204(1)	Advanced Excel Modelling	2+2	3
CSE1016Y(1)	Communications and Business Skills for IT	3+0	6
CSE1032Y(1)	Web Design And Development	2+2	6
MA2002(3)	Discrete Mathematics	3+0	3
MA2003(3)	Vector & Tensor Analysis	3+0	3
CSE2035Y(3)	Software Modelling and Design	2+2	6
MA2203(3)	Linear Regression Analysis	3+0	3
MA2205(3)	Numerical Linear Algebra	3+0	3
MA2208(3)	Metric Spaces	3+0	3
MA2210(3)	Data Science and Data Analytics	3+0	3
MA3003(5)	Numerical Solution of PDE's	3+0	3
MA3004(5)	Optimisation	3+0	3
MA3010(5)	Mathematical Modelling	3+0	3
MA3011(5)	Time Series Analysis I	3+0	3
MA3102(5)	Fluid Dynamics I	3+0	3
CSE3123Y(5)	Mobile Computing and Wireless Technologies	2+2	6
MA3202(5)	Functional Analysis	3+0	3
MA3203(5)	Multivariate Analysis	3+0	3

11. Programme Plan - BSc (Hons) Mathematics with Computer Science

YEAR 1				YEAR 1			
Semester 1	Module Name	Hrs/Wk	Credits	Semester 2	Module Name	Hrs/Wk	Credits
Code		L+P		Code		L+P	
CORE				CORE			
MA1111(1)	Mathematical Techniques I	3+0	3	MA1211(1)	Mathematical Techniques II	3+0	3
MA1112(1)	Mathematical Analysis I	3+0	3	MA1212(1)	Mathematical Analysis II	3+0	3
MA1113(1)	Applied Mathematics I	3+0	3	MA1205(1)	Algebra for Computer Science	3+0	3
MA1115(1)	Probability & Statistics	3+0	3				
MA1117(1)	Excel Modelling	2+2	3				
CSE1031Y(1)	Database Systems and Administration	2+2	6				
CSE1038Y(1)	Programming and Data Structures	2+2	6				
ELECTIVES:							
CSE1016Y(1)	Communications and Business Skills for IT	3+0	6	MA1204(1)	Advanced Excel Modelling	2+2	3
CSE1032Y(1)	Web Design and Development	2+2	6				

SubTotal = 36

YEAR 2				YEAR 2			
Semester 1	Module Name	Hrs/Wk	Credits	Semester 2	Module Name	Hrs/Wk	Credits
Code		L+P		Code		L+P	
CORE				CORE			
MA2111(3)	Numerical Analysis I	3+0	3	MA2202(3)	Linear Programming	3+0	3
MA2112(3)	Mathematical Methods I	3+0	3	MA2204(3)	Numerical Analysis II	3+0	3
MA2113(3)	Mathematical Statistics	3+0	3	WCS 2200(3)	Writing Case Studies	*	3
MA2104(3)	Complex Analysis	3+0	3				
MA2118(3)	Linear Algebra	3+0	3				
CSE2019Y(3)	Algorithms and Complexities	2+2	6				

* 9 Hours of Lectures and 36 Hours Self Study

NOTE: AT LEAST 6 CREDITS FROM THE FOLLOWING ELECTIVES:

CSE2035Y(3)	Software Modelling and Design	2+2	6	MA2203(3)	Linear Regression Analysis	3+0	3
MA2002(3)	Discrete Mathematics	3+0	3	MA2205(3)	Numerical Linear Algebra	3+0	3
MA2003(3)	Vector & Tensor Analysis	3+0	3	MA2210(3)	Data Science and Data Analytics	3+0	3
MA2208(3)	Metric Spaces	3+0	3				

SubTotal = 36

YEAR 3				YEAR 3			
Semester 1	Module Name	Hrs/Wk	Credits	Semester 2	Module Name	Hrs/Wk	Credits
Code		L+P		Code		L+P	
CORE				CORE			
MA3000Y(5)	Project	-	7	MA3201(5)	Applied Probability	3+0	3
MA3101(5)	Measure & Integral	3+0	3				
Either							
CSE3053Y(5)	Computer Networks and System Administration	2+2	6				
Or							
CSE3096Y(5)	Cloud Computing and Big Data	2+2	6				
NOTE: AT LEAST 9 CREDITS FROM THE FOLLOWING ELECTIVES:							
CSE3123Y(5)	Mobile Computing & Wireless Technologies	2+2	6	MA3202(5)	Functional Analysis	3+0	3
MA3003(5)	Numerical Solution of PDE's	3+0	3	MA3203(5)	Multivariate Analysis	3+0	3
MA3004(5)	Optimisation	3+0	3				
MA3010(5)	Mathematical Modelling	3+0	3				
MA3011(5)	Time Series Analysis I	3+0	3				
MA3102(5)	Fluid Dynamics I	3+0	3				

SubTotal = 28
Total = 100

Note: Electives may be offered in semester 1 or 2 & not all electives may be on offer.