

BSc (Hons) Mathematics with Computer Science - SCE321

1. Objectives

The interface between Mathematics and Computer Science is of major importance as these disciplines now form the nucleus of a new science of information and communication. Mobile computing, security and encryption and concurrency are examples of topics which are attracting much interest in the academic world and which have a significant commercial impact.

The BSc (Hons) Mathematics with Computer Science covers the fundamentals of mathematics and computer science. It aims at preparing graduates for employment in application areas that require substantial input from both these two disciplines. The programme also aims in providing students with sufficient knowledge to enable them to pursue further studies in advanced computer science and computational mathematics.

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.

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:

	Credits from		
Degree	Core Taught Modules	Project^a	Electives
BSc (Hons) Mathematics with Computer Science	66	10	Minimum 24 ^b

^a Project normally in Major.

^b A minimum of 18 credits to be obtained from Computer Science electives with at least 12 credits from level/year 2 and level/year 3 electives. At least 3 credits from level/year 3 Mathematics electives.

7. Assessment

Each yearly module will be assessed over 100 marks whereas each semester module may either be assessed singly over 100 marks or it may be combined with another semester module and assessed jointly over 100 marks with details as follows (unless otherwise specified):

Assessment will be based on a written examination of 2 to 3-hour duration (normally a paper of 2 hour duration for modules carrying less or equal to three credits and 3 hour paper for modules carrying five-six credits) and on continuous assessment done during the semester or year.

Written examinations for all modules, whether taught in semester 1 or in semester 2 or both, will be carried out at the end of the academic year (unless otherwise stated).

The continuous assessment will count for 10-40% of the overall percentage mark of the module(s), except for a Programme where the *structure* makes for other specific provision(s). Continuous assessment may be based on laboratory work, seminars and/or assignments and should include at least 1 class test.

There will be a compulsory class test for all modules taught in semester 1 at the end of semester 1 of the given academic year unless stated otherwise in the Programme Structure.

A minimum of at least 30% should be attained in each of continuous assessment and written examination, with an overall total of 40% for a candidate to pass a module. For modules being assessed jointly, a minimum of at least 30% should be attained in each of continuous assessment and written examination, with an overall total of 40% for a candidate to pass the two modules. Note that the marks for the two modules will be considered together and not the individual marks for each of the two modules.

Special examinations (e.g. class tests) will be arranged at the end of semester 1 or semester 2 for exchange students who have registered only for one semester. In case of yearly modules, credits will be assigned on a pro-rata basis.

Projects/Dissertations will carry 10 credits for degree award. They will normally be carried out in the area of specialisation.

The following pairs of semester modules will be assessed jointly:
 MATH 1131(1)/MATH 1231(1); MATH 1141(1)/MATH 1241(1); MATH 2111(3)/MATH 2211(3);
 MATH 2131(3)/MATH 2241(3); MATH 2141(3)/MATH 2231(3).

SCI 1010(1) will carry 100 marks and will be assessed solely by continuous assessment.

8. List of Modules

A. MATHEMATICS CORE MODULES (63 + 10 credits)

Code	Module Name	Hrs/Wk	Credits
CSE 1010e(1)	Introduction to IT	O.E.	3
MATH 1111(1)	Mathematics I	D.E.	3
MATH 1021Y(1)	Analysis	3+0	6
MATH 1131(1)	Mechanics I	3+0	3
MATH 1141(1)	Algebra	3+0	3
MATH 1211(1)	Mathematics II	D.E.	3
MATH 1231(1)	Computer Programming I	2+2	3
MATH 1241(1)	Probability & Statistics	3+0	3
MATH 2111(3)	Complex Analysis	3+0	3
MATH 2021Y(3)	Numerical Analysis	3+0	6
MATH 2131(3)	Mathematical Methods I	3+0	3
MATH 2141(3)	Linear Algebra	3+0	3
MATH 2211(3)	Metric Spaces	3+0	3
MATH 2231(3)	Mathematical Programming	3+0	3
MATH 2241(3)	Mathematical Statistics	3+0	3
MATH 3000(5)	Project	-	10
MATH 3111(5)	Lebesgue Measure and Integral	3+0	3
MATH 3121(5)	Fluid Dynamics I	3+0	3
MATH 3211(5)	Functional Analysis	3+0	3
MATH 3221(5)	Applied Probability	3+0	3

SCI 1010(1)	Computing Environment and Tools for Scientific Reporting	2+2	3
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B. MATHEMATICS ELECTIVES (Not all modules may be on offer)

MATH 2151(3)	Linear Statistical Models	3+0	3
MATH 2171(3)	Discrete Mathematics	3+0	3
MATH 2251(3)	Numerical Linear Algebra	3+0	3
MATH 2271(3)	Computer Programming II	2+2	3
MATH 3131(5)	Operational Research	3+0	3
MATH 3141(5)	Multivariate Analysis	3+0	3
MATH 3151(5)	Numerical Solution of PDE's	3+0	3
MATH 3231(5)	Optimisation	3+0	3
MATH 3241(5)	Time Series Analysis	3+0	3
MATH 3251(5)	Fluid Dynamics II	3+0	3

C. COMPUTER SCIENCE ELECTIVES (Not all modules may be on offer)

CSE 1002Y(3)	Programming Methodology	2+2	6
CSE 1004Y(1)	Structured Systems Development	2+2	6
CSE 2002Y(3)	Database Systems	2.5+1	6
CSE 2004Y(3)	Prog Languages and Algorithms	2+2	6
CSE 2006Y(3)	Systems Software	2+2	6
CSE 3001Y(5)	Distributed Systems and Multimedia	3+0	6
CSE 3002Y(5)	Computer Networks	3+0	6

E. OTHER ELECTIVES

Approved modules offered by other units/departments.

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

YEAR 1							
Semester 1				Semester 2			
Code	Module Name	Hrs/Wk L+P	Credits	Code	Module Name	Hrs/Wk L+P	Credits
CORE				CORE			
CSE 1010e(1)	Introduction to IT	O.E.	3	MATH 1211(1)	Mathematics II	D.E.	3
MATH 1111(1)	Mathematics I	D.E.	3	MATH 1021Y(1)	Analysis	3+0	6
MATH 1021Y(1)	Analysis	3+0	-	MATH 1231(1)	Computer Programming I	2+2	3
MATH 1131(1)	Mechanics I	3+0	3	MATH 1241(1)	Probability & Statistics	3+0	3
MATH 1141(1)	Algebra	3+0	3				
SCI 1010(1)	Computing Environments & Tools for Sci. Reporting	2+2	3				
ELECTIVES				ELECTIVES			
CSE 1002Y(3)	Programming Methodology	2+2	-	CSE 1002Y(3)	Programming Methodology	2+2	6
CSE 1004Y(1)	Structured Systems Development	2+2	-	CSE 1004Y(1)	Structured Systems Development	2+2	6

YEAR 2

Semester 1				Semester 2			
Code	Module Name	Hrs/Wk L+P	Credits	Code	Module Name	Hrs/Wk L+P	Credits
CORE				CORE			
MATH 2111(3)	Complex Analysis	3+0	3	MATH 2211(3)	Metric Spaces	3+0	3
MATH 2021Y(3)	Numerical Analysis	3+0	-	MATH 2021Y(3)	Numerical Analysis	3+0	6
MATH 2131(3)	Mathematical Methods I	3+0	3	MATH 2231(3)	Mathematical Programming	3+0	3
MATH 2141(3)	Linear Algebra	3+0	3	MATH 2241(3)	Mathematical Stats	3+0	3
ELECTIVES				ELECTIVES			
CSE 2002Y(3)	Database Systems	2.5+1	-	CSE 2002Y(3)	Database Systems	2.5+1	6
CSE 2004Y(3)	Programming Languages and Algorithms	2+2	-	CSE 2004Y(3)	Programming Languages and Algorithms	2+2	6
CSE 2006Y(3)	Systems Software	2+2	-	CSE 2006Y(3)	Systems Software	2+2	6
MATH 2151(3)	Linear Statistical Models	3+0	3	MATH 2251(3)	Numerical Linear Algebra	3+0	3
MATH 2171(3)	Discrete Mathematics	3+0	3	MATH 2271(3)	Computer Programming II	2+2	3

YEAR 3

Semester 1				Semester 2			
Code	Module Name	Hrs/Wk L+P	Credits	Code	Module Name	Hrs/Wk L+P	Credits
CORE				CORE			
MATH 3000(5)	Project	-	-	MATH 3000(5)	Project	-	10
MATH 3111(5)	Lebesgue Measure & Integral	3+0	3	MATH 3211(5)	Functional Analysis	3+0	3
MATH 3121(5)	Fluid Dynamics I	3+0	3	MATH 3221(5)	Applied Probability	3+0	3
ELECTIVES				ELECTIVES			
CSE 3001Y(5)	Distributed Systems and Multimedia	3+0	-	CSE 3001Y(5)	Distributed Systems and Multimedia	3+0	6
CSE 3002Y(5)	Computer Networks	3+0	-	CSE 3002Y(5)	Computer Networks	3+0	6
MATH 3131(5)	Operational Research	3+0	3	MATH 3231(5)	Optimisation	3+0	3
MATH 3141(5)	Multivariate Analysis	3+0	3	MATH 3241(5)	Time Series Analysis	3+0	3
MATH 3151(5)	Numl. Soln. of PDEs	3+0	3	MATH 3251(5)	Fluid Dynamics II	3+0	3

NOTE: NOT ALL ELECTIVES MAY BE ON OFFER

The following pairs of semester modules will be assessed jointly:
MATH 1131(1)/MATH 1231(1); MATH 1141(1)/MATH 1241(1); MATH 2111(3)/MATH 2211(3);
MATH 2131(3)/MATH 2241(3); MATH 2141(3)/MATH 2231(3).

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