BSc (Hons) Mathematics - SC320a

1. Objectives

Mathematics is the key to many real-life activities, whether for the encryption of emails, analysis of business performance or managing disease outbreak. Almost all areas of human activity or advanced technologies require mathematics and this makes mathematicians valuable to the country's economy.

The BSc (Hons) Mathematics programme provides fundamental knowledge in Mathematics, including both pure and applied Mathematics. Students are given opportunities to develop high-level mathematical and problem-solving skills and to apply these in a variety of careers such as in teaching, computing and industry. The programme also offers adequate background to those willing to pursue further studies and research.

The objectives are:

- to provide a course that is suitable for both students aiming to pursue research and going into other careers;
- to develop in students the capacity for independent learning and for clear logical thinking;
- to produce the high calibre graduates in Mathematics sought by employers in the private & public sectors;
- to provide an intellectually stimulating environment in which students have the opportunity to develop their skills to their full potential;
- to develop intellectual integrity, respect for truth and for the ethics of research and scholarly activity.

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 Semester

Minimum: 9 credits; Maximum (including retake modules): 24 credits.

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

Breakdown as follows:

Degree	Core Taught Modules	Project	Electives
BSc (Hons) Mathematics	72	7	Minimum 21[a,b]

[a] 6 credits from year 1 electives,
[b] 6 credits from Mathematics year 2 electives and 9 credits from Mathematics year 3 electives.

7. Assessment

Each module will be assessed over 100 marks which include a written examination of 2-hour duration for modules carrying less than or equal to three credits unless specified otherwise and continuous assessment.

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.

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:

MA1107(1)
MA1203(1)
MA1204(1)
MA3010(5)

8.   **List of Modules**

A.   Core Modules (72 + 7 Credits)

Code	Module Name	Hrs/Wk/ L+P	Credits
MA1101(1)	Mathematical Techniques I	3+0	3
MA1102(1)	Mathematical Analysis I	3+0	3
MA1103(1)	Applied Mathematics I	3+0	3
MA1104(1)	Algebra	3+0	3
MA1105(1)	Probability & Statistics	3+0	3
MA1107(1)	Excel Modelling	2+2	3
MA1201(1)	Mathematical Techniques II	3+0	3
MA1202(1)	Mathematical Analysis II	3+0	3
MA1203(1)	Mathematical Computing	2+2	3
MA1204(1)	Advanced Excel Modelling	2+2	3
MA2101(3)	Numerical Analysis I	3+0	3
MA2102(3)	Mathematical Methods I	3+0	3
MA2103(3)	Mathematical Statistics	3+0	3
MA2104(3)	Complex Analysis	3+0	3
MA2108(3)	Linear Algebra	3+0	3
MA2202(3)	Linear Programming	3+0	3
MA2203(3)	Linear Regression Analysis	3+0	3
MA2204(3)	Numerical Analysis II	3+0	3
MA2205(3)	Numerical Linear Algebra	3+0	3
MA2208(3)	Metric Spaces	3+0	3
MA3000Y(5)	Project	-	7
MA3101(5)	Measure and Integral	3+0	3
MA3102(5)	Fluid Dynamics I	3+0	3
MA3201(5)	Applied Probability	3+0	3
MA3202(5)	Functional Analysis	3+0	3

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

Code	Module Name	Hrs/Wk/ L+P	Credits
MA1001(1)	Financial Mathematics	3+0	3
MA1002(1)	Applied Mathematics II	3+0	3
MA1003(1)	Descriptive Statistics	3+0	3
MA2001(3)	Group Theory	3+0	3
MA2002(3)	Discrete Mathematics	3+0	3
MA2003(3)	Vector and Tensor Analysis	3+0	3
MA2005(3)	Mathematical Methods II	3+0	3
MA3001(5)	Operational Research	3+0	3
MA3003(5)	Numerical Solution of PDE's	3+0	3
MA3004(5)	Optimisation	3+0	3
MA3006(5)	Fluid Dynamics II	3+0	3
MA3007(5)	Rings and Fields	3+0	3
MA3008(5)	Topology	3+0	3
MA3009(5)	Dynamical Systems	3+0	3
MA3010(5)	Mathematical Modelling	3+0	3

9.   Programme Plan - BSc (Hons) Mathematics

YEAR 1

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA1101(1)	Mathematical Techniques I	3+0	3	MA1201(1)	Mathematical Techniques II	3+0	3
MA1102(1)	Mathematical Analysis I	3+0	3	MA1202(1)	Mathematical Analysis II	3+0	3
MA1103(1)	Applied Mathematics I	3+0	3	MA1203(1)	Mathematical Computing	2+2	3
MA1104(1)	Algebra	3+0	3	MA1204(1)	Advanced Excel Modelling	2+2	3
MA1105(1)	Probability & Statistics	3+0	3	**AT LEAST TWO ELECTIVES FROM:**			
MA1107(1)	Excel Modelling	2+2	3	MA1001(1)	Financial Mathematics I	3+0	3
				MA1002(1)	Applied Mathematics II	3+0	3
				MA1003(1)	Descriptive Statistics	3+0	3

YEAR 2

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA2101(3)	Numerical Analysis I	3+0	3	MA2202(3)	Linear Programming	3+0	3
MA2102(3)	Mathematical Methods I	3+0	3	MA2203(3)	Linear Regression Analysis	3+0	3
MA2103(3)	Mathematical Statistics	3+0	3	MA2204(3)	Numerical Analysis II	3+0	3
MA2104(3)	Complex Analysis	3+0	3	MA2205(3)	Numerical Linear Algebra	3+0	3
MA2108(3)	Linear Algebra	3+0	3	MA2208(3)	Metric Spaces	3+0	3

NOTE: AT LEAST TWO ELECTIVES FROM:

MA2001(3)	Group Theory	3+0	3	MA2003(3)	Vector & Tensor Analysis	3+0	3
MA2002(3)	Discrete Mathematics	3+0	3	MA2005(3)	Mathematical Methods II	3+0	3

YEAR 3

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA3000Y(5)	Project	-	7				
MA3101(5)	Measure and Integral	3+0	3	MA3201(5)	Applied Probability	3+0	3
MA3102(5)	Fluid Dynamics I	3+0	3	MA3202(5)	Functional Analysis	3+0	3

NOTE: AT LEAST THREE ELECTIVES FROM

MA3001(5)	Operational Research	3+0	3	MA3007(5)	Rings & Fields	3+0	3
MA3003(5)	Numerical Solution of PDEs	3+0	3	MA3008(5)	Topology	3+0	3
MA3004(5)	Optimisation	3+0	3	MA3009(5)	Dynamical Systems	3+0	3
MA3006(5)	Fluid Dynamics II	3+0	3	MA3010(5)	Mathematical Modelling	3+0	3

Note:
1. *Electives may be offered in either semester 1 or 2 and not all electives may be on offer.*
2. *A total of at least 5 electives from Year 2 & Year 3 with a minimum of three electives from Year 3.*

BSc (Hons) Mathematics with Statistics - SC320b

1. Objectives

Mathematics forms part of everyone's daily life. It is used in mobile technology, website security, ATMs, online games and analysis of statistical data. Indeed there has always been a sustainable interest in exploring and explaining the uncertain world in which we live. The study of Statistics addresses this issue and it is in fact widely used for opinion polls and market research. Both private and public sectors need statisticians, especially in areas such as environmental science, forensic science, pharmaceutical industry and government statistics.

This 3-year BSc (Hons) Mathematics with Statistics programme fulfils this purpose. The first year develops and strengthens the background of probability and statistics, but also introduces professional software such as Excel. In the second year students can master more advanced statistical techniques such as regression analysis, survey sampling, and design of experiments. After this solid base is established, the final year features more choice, including time series and multivariate analysis.

The objectives are:

- to better equip students with mathematical tools and theoretical understanding to understand and analyse large amount of data that science, government and industry generate.
- to provide a good knowledge and skills of both mathematics and statistics which keep career options broad.

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 Semester

Minimum: 9 credits; Maximum (including retake modules): 24 credits.

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

Breakdown as follows:

Degree	Core Taught Modules	Project	Electives
BSc (Hons) Mathematics with Statistics	75	7	Minimum 18[a, b, c]

[a] 6 credits from year 1 electives,
[b] at least 3 credits from year 2,
[c] at least 9 credits from year 3.

7.   Assessment

Each module will be assessed over 100 marks which include a written examination of 2-hour duration for modules carrying less than or equal to three credits unless specified otherwise and continuous assessment.

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.

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:

MA1107(1)
MA1203(1)
MA1204(1)

8. List of Modules

A. Core Modules (75+7 credits)

Code	Module Name	Hrs/Wk/L+P	Credits
MA1101(1)	Mathematical Techniques I	3+0	3
MA1102(1)	Mathematical Analysis I	3+0	3
MA1103(1)	Applied Mathematics I	3+0	3
MA1104(1)	Algebra	3+0	3
MA1105(1)	Probability & Statistics	3+0	3
MA1107(1)	Excel Modelling	2+2	3
MA1201(1)	Mathematical Techniques II	3+0	3
MA1202(1)	Mathematical Analysis II	3+0	3
MA1203(1)	Mathematical Computing	2+2	3
MA1204(1)	Advanced Excel Modelling	2+2	3
MA2101(3)	Numerical Analysis I	3+0	3
MA2102(3)	Mathematical Methods I	3+0	3
MA2103(3)	Mathematical Statistics	3+0	3
MA2104(3)	Complex Analysis	3+0	3
MA2107(3)	Survey Sampling	3+0	3
MA2108(3)	Linear Algebra	3+0	3
MA2202(3)	Linear Programming	3+0	3
MA2203(3)	Linear Regression Analysis	3+0	3
MA2205(3)	Numerical Linear Algebra	3+0	3
MA2207(3)	Design and Analysis of Experiments	3+0	3
MA2208(3)	Metric Spaces	3+0	3
MA3000Y(5)	Project	-	7
MA3101(5)	Measure and Integral	3+0	3
MA3103(5)	Generalised Linear Models	3+0	3
MA3201(5)	Applied Probability	3+0	3
MA3203(5)	Multivariate Analysis	3+0	3

B. Elective Modules (Not all modules may be offered)

Code	Module Name	Hrs/Wk/ L+P	Credits
MA1001(1)	Financial Mathematics I	3+0	3
MA1003(1)	Descriptive Statistics	3+0	3
MA1004(1)	Simulation Modelling and Analysis	3+0	3
MA2007(3)	Survival Analysis	3+0	3
MA2008(3)	Statistical Quality Control	3+0	3
MA2009(3)	Actuarial Mathematics	3+0	3
MA2209(3)	Risk Analysis I	3+0	3
MA3005(5)	Statistical Methods for Finance	3+0	3
MA3011(5)	Time Series Analysis I	3+0	3
MA3012(5)	Geostatistics	3+0	3
MA3013(5)	Statistical Data Mining	3+0	3
MA3015(5)	Bayesian Statistics	3+0	3
MA3016(5)	Game Theory	3+0	3
MA3017(5)	Time Series Analysis II	3+0	3
MA3019(5)	Computational Statistics	3+0	3

9. Programme Plan – BSc (Hons) Mathematics with Statistics

YEAR 1

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA1101(1)	Mathematical Techniques I	3+0	3	MA1201(1)	Mathematical Techniques II	3+0	3
MA1102(1)	Mathematical Analysis I	3+0	3	MA1202(1)	Mathematical Analysis II	3+0	3
MA1103(1)	Applied Mathematics I	3+0	3	MA1203(1)	Mathematical Computing	2+2	3
MA1104(1)	Algebra	3+0	3	MA1204(1)	Advanced Excel Modelling	2+2	3
MA1105(1)	Probability & Statistics	3+0	3	**AT LEAST TWO ELECTIVES FROM:**			
MA1107(1)	Excel Modelling	2+2	3	MA1001(1)	Financial Mathematics I	3+0	3
				MA1003(1)	Descriptive Statistics	3+0	3
				MA1004(1)	Simulation Modelling and Analysis	3+0	3

YEAR 2

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA2101(3)	Numerical Analysis I	3+0	3	MA2202(3)	Linear Programming	3+0	3
MA2102(3)	Mathematical Methods I	3+0	3	MA2203(3)	Linear Regression Analysis	3+0	3
MA2103(3)	Mathematical Statistics	3+0	3	MA2205(3)	Numerical Linear Algebra	3+0	3
MA2104(3)	Complex Analysis	3+0	3	MA2207(3)	Design and Analysis of Experiments	3+0	3
MA2107(3)	Survey Sampling	3+0	3	MA2208(3)	Metric Spaces	3+0	3
MA2108(3)	Linear Algebra	3+0	3				

NOTE: AT LEAST ONE ELECTIVE FROM:

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
MA2007(3)	Survival Analysis	3+0	3	MA2009(3)	Actuarial Mathematics	3+0	3
MA2008(3)	Statistical Quality Control	3+0	3	MA2209(3)	Risk Analysis I	3+0	3

YEAR 3

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA3000Y(5)	Project	-	7	MA3201(5)	Applied Probability	3+0	3
MA3101(5)	Measure and Integral	3+0	3	MA3203(5)	Multivariate Analysis	3+0	3
MA3103(5)	Generalised Linear Models	3+0	3				

NOTE: AT LEAST THREE ELECTIVES FROM:

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
MA3005(5)	Statistical Methods for Finance	3+0	3	MA3015(5)	Bayesian Statistics	3+0	3
MA3011(5)	Time Series Analysis I	3+0	3	MA3016(5)	Game Theory	3+0	3
MA3012(5)	Geostatistics	3+0	3	MA3017(5)	Time Series Analysis II	3+0	3
MA3013(5)	Statistical Data Mining	3+0	3	MA3019(5)	Computational Statistics	3+0	3

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

BSc (Hons) Mathematics with Finance - SC320c

1.   Objectives

The expansion of the financial sector in Mauritius has undeniably resulted in the high demand of graduates in mathematics who are able to synthesize expertise acquired in areas such as operation of international finance, capital and investment markets, and actuarial science. The students are expected to carry out sophisticated work with the latest technology. This BSc (Hons) Mathematics with Finance degree provides the necessary background to succeed in today's financial industry as financial analyst among others.

The BSc (Hons) Mathematics with Finance programme offers a combination of training in Pure & Applied Mathematics, Probability & Statistics and Finance, including general and applied financial theory. The objectives are:

- to provide a challenging course in Mathematics, combined with Finance and its applications, for a range of students;
- to provide a course that is both suitable for students aiming to pursue research and for students going into other careers;
- to develop in students the analytical and logical skills related to the knowledge of Finance, backed up by mathematical knowledge, that are highly valued by employers;
- to produce the high calibre graduates sought by employers in the private and public sectors, in areas of banking, accountancy, insurance, offshore, sales and marketing;
- to provide an intellectually stimulating environment in which students have the opportunity to develop their skills to their full potential.

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 Semester

Minimum: 9 credits; Maximum (including retake modules): 24 credits.

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

Breakdown as follows:

Degree	Core Taught Modules	Project	Electives
BSc (Hons) Mathematics with Finance	72	7	Minimum 21[a,b,c]

[a] 6 credits from year 1 electives,
[b] 6 credits from year 2 electives,
[c] 9 credits from year 3 electives.

7. **Assessment**

Each module will be assessed over 100 marks which include a written examination of 2-hour duration for modules carrying less than or equal to three credits unless specified otherwise and continuous assessment.

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.

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:

MA1107(1)
MA1203(1)
MA1204(1)

8. List of Modules

A. Core Modules (72 + 7 Credits)

Code	Module Name	Hrs/Wk L+P	Credits
MA1101(1)	Mathematical Techniques I	3+0	3
MA1102(1)	Mathematical Analysis I	3+0	3
MA1103(1)	Applied Mathematics I	3+0	3
MA1104(1)	Algebra	3+0	3
MA1105(1)	Probability & Statistics	3+0	3
MA1107(1)	Excel Modelling	2+2	3
MA1201(1)	Mathematical Techniques II	3+0.	3
MA1202(1)	Mathematical Analysis II	3+0	3
MA1203(1)	Mathematical Computing	2+2	3
MA1204(1)	Advanced Excel Modelling	2+2	3
MA2101(3)	Numerical Analysis I	3+0	3
MA2102(3)	Mathematical Methods I	3+0	3
MA2103(3)	Mathematical Statistics	3+0	3
MA2108(3)	Linear Algebra	3+0	3
MA2202(3)	Linear Programming	3+0	3
MA2203(3)	Linear Regression Analysis	3+0	3
MA2206(3)	Fixed Income Analysis	3+0	3
MA2209(3)	Risk Analysis I	3+0	3
DFA2002Y(3)	Corporate Finance	3+0	6
MA3000Y(5)	Project	-	7
MA3204(5)	Risk Analysis II	3+0	3
MA3105(5)	Financial Derivatives	3+0	3
MA3201(5)	Applied Probability	3+0	3
MA3204(5)	Stochastic Calculus	3+0	3

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

Code	Module Name	Hrs/Wk L+P	Credits
ACF1000(1)	Accounting for Financial Decision Making	3+0	3
ACF1002(1)	Principles of Finance	3+0	3
MA1001(1)	Financial Mathematics	3+0	3
MA2006(3)	Alternative Investments	3+0	3
MA2009(3)	Actuarial Mathematics	3+0	3
DFA2012Y(3)	Portfolio Theory & Fixed Income Securities	3+0	6
MA3005(5)	Statistical Methods for Finance	3+0	3
MA3011(5)	Time Series Analysis I	3+0	3
MA3017(5)	Time Series Analysis II	3+0	3
MA3018(5)	Discrete Time Finance	3+0	3
DFA3006Y(5)	International Finance	3+0	6

9.   Programme Plan - BSc (Hons) Mathematics with Finance

YEAR 1

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA1101(1)	Mathematical Techniques I	3+0	3	MA1201(1)	Mathematical Techniques II	3+0	3
MA1102(1)	Mathematical Analysis I	3+0	3	MA1202(1)	Mathematical Analysis II	3+0	3
MA1103(1)	Applied Mathematics I	3+0	3	MA1203(1)	Mathematical Computing	2+2	3
MA1104(1)	Algebra	3+0	3	MA1204(1)	Advanced Excel Modelling	2+2	3
MA1105(1)	Probability & Statistics	3+0	3	**AT LEAST TWO ELECTIVES FROM:**			
MA1107(1)	Excel Modelling	2+2	3	MA1001(1)	Financial Mathematics	3+0	3
				ACF1000(1)	Accounting for Financial Decision Making	3+0	3
				ACF1002(1)	Principles of Finance	3+0	3

YEAR 2

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA2101(3)	Numerical Analysis I	3+0	3	MA2202(3)	Linear Programming	3+0	3
MA2102(3)	Mathematical Methods I	3+0	3	MA2203(3)	Linear Regression Analysis	3+0	3
MA2103(3)	Mathematical Statistics	3+0	3	MA2206(3)	Fixed Income Analysis	3+0	3
MA2108(3)	Linear Algebra	3+0	3	MA2209(3)	Risk Analysis I	3+0	3
DFA2002Y(3)	Corporate Finance	3+0	6				

NOTE: AT LEAST 6 CREDITS FROM THE FOLLOWING ELECTIVES:

DFA2012Y(3)	Portfolio Theory & Fixed Income Securities	3+0	6	MA2009(3)	Actuarial Mathematics	3+0	3
MA2006(3)	Alternative Investments	3+0	3				

YEAR 3

Semester 1 Code	Module Name	Hrs/Wk L+P	Credits	Semester 2 Code	Module Name	Hrs/Wk L+P	Credits
CORE				**CORE**			
MA3000Y(5)	Project	-	7				
MA3104(5)	Risk Analysis II	3+0	3	MA3201(5)	Applied Probability	3+0	3
MA3105(5)	Financial Derivatives	3+0	3	MA3204(5)	Stochastic Calculus	3+0	3

NOTE: AT LEAST 9 CREDITS FROM THE FOLOWING ELECTIVES:

MA3005(5)	Statistical Methods for Finance	3+0	3	MA3017(5)	Time Series Analysis II	3+0	3
MA3011(5)	Time Series Analysis I	3+0	3	MA3018(5)	Discrete Time Finance	3+0	3
DFA3006Y(5)	International Finance	3+0	6				

Note:
1. *Electives may be offered in either semester 1 or 2 and not all electives may be on offer.*
2. *Students opting for BSc (Hons) Mathematics with Finance should register for ACF1000(1) and ACF1002(1) as electives in Year I.*