BSc (Hons) MATHEMATICS / FULL TIME (UNDER REVIEW) - SC320a

1. CONTEXT AND OBJECTIVES

Mathematics is the key to many real-life activities, whether for the encryption of emails, analysis of business performance or managing disease outbreaks. 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 both for 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 and 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. LEARNING OUTCOMES

Upon completion of this programme, graduates should have:

a. **Subject knowledge**
- A thorough understanding of core mathematical principles.
- Well-developed problem solving and analytical skills.
- A grounding in statistical reasoning.
- An ability to use computers, both for scientific computation and for general applications.
- An appreciation of the ways in which mathematical thinking can be utilised in the real world.

- Acquisition of specialist knowledge and understanding, especially towards the later stages of the programme.

b. **Cognitive/Analytical**
- Analyse and solve mathematical problems proficiently.
- Appreciate ways in which mathematical thinking can be utilised in the real world.
- Work under supervision on a placement that requires mathematical skills.

c. **Professional/Practical skills**
- Use computers and IT for data analysis and presentation, scientific computation and general purpose applications.

d. **Transferable skills**
- Information literacy skills, including the ability to research, summarise and understand mathematical topics and to reference it in an academically rigorous way.

3. TEACHING AND LEARNING METHODS

Modules shall be taught over 10 weeks and shall include 3 hours of contact per week, involve 6 hours of self-study per week and 9 hours of other learning activities per week for each semester. The 30 hours of contact shall include class hours, tutorials and practicals.

- By its nature, mathematics has to be presented logically. Lectures and model examples to problems provide an insight of this logical structure. Lectures provide the core method for the presentation of the knowledge required for students to be successful.
- Tutorial problems and assignments enhance the student's logical reasoning skills and additionally develop skills in organising their reasoning, selection of techniques and application of mathematics for problem solving.
- Projects (Mini and final year) will offer the students the opportunity to identify what it takes to carry out a longer individual/ group-based investigation into the applications of Mathematics at work.
- Communication through reports and/or oral presentations forms part of some of the modules offered.
- Basic computer modelling skills are developed through the mathematical modelling modules with the use of appropriate software.

4. ENTRY REQUIREMENTS

- *General Requirements*
  General: As per General Entry Requirements for admission to the University for undergraduate degrees.
- *Programme (Specific) Requirements*
  Programme (Specific): Minimum Grade 'C' in Mathematics at GCE 'A' level.

5. PROGRAMME DURATION

	Normal	Maximum
Degree	3 Years (6 semesters)	5 Years (10 semesters)

6. MINIMUM LCCS CREDITS REQUIRED:

- For Degree Award : 200

Breakdown as follows:

Degree	LCCS Credits Core Taught Modules	LCCS Credits Project	LCCS Credits Electives
BSc(Hons) Mathematics	**144**	**14**	**Minimum 42[a,b]**

[a] 12 LCCS credits from year 1 electives,

[b] 12 LCCS credits from Mathematics year 2 electives and 18 LCCS credits from Mathematics year 3 electives.

LCCS credits per Semester:

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

7.   ASSESSMENT AND DEADLINES

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

Written examinations accounting for 60%, will be carried out at the end of the semester in which they are taught.

The continuous assessment will count for 40% 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 class test.

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

Projects/Dissertations will carry 14 LCCS credits for degree award.

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

MA1108(1)

MA1203(1)

MA1208(1)

MA3010(5)

8. LIST OF MODULES

A. Core Modules (144 + 14 LCCS credits)

Code	Module Name	Contact hrs (L/T+P)	Self-Study hrs	Other Learning Activities/hrs	LCCS Credits
MA1101(1)	Mathematical Techniques I	30+0	60	90	6
MA1102(1)	Mathematical Analysis I	30+0	60	90	6
MA1103(1)	Applied Mathematics I	30+0	60	90	6
MA1104(1)	Algebra	30+0	60	90	6
MA1105(1)	Probability & Statistics	30+0	60	90	6
MA1108(1)	Spreadsheet Modelling	20+20	60	80	6
MA1201(1)	Mathematical Techniques II	30+0	60	90	6
MA1202(1)	Mathematical Analysis II	30+0	60	90	6
MA1203(1)	Mathematical Computing	20+20	60	80	6
MA1208(1)	Advanced Spreadsheet Modelling and Simulation	20+20	60	80	6
MA2101(3)	Numerical Analysis I	30+0	60	90	6
MA2102(3)	Mathematical Methods I	30+0	60	90	6
MA2103(3)	Mathematical Statistics	30+0	60	90	6
MA2104(3)	Complex Analysis	30+0	60	90	6
MA2108(3)	Linear Algebra	30+0	60	90	6
MA2202(3)	Linear Programming	30+0	60	90	6
MA2203(3)	Linear Regression Analysis	30+0	60	90	6
MA2204(3)	Numerical Analysis II	30+0	60	90	6
MA2205(3)	Numerical Linear Algebra	30+0	60	90	6
MA2208(3)	Metric Spaces	30+0	60	90	6
MA3000Y(5)	Project	-			14
MA3101(5)	Measure and Integral	30+0	60	90	6
MA3102(5)	Fluid Dynamics I	30+0	60	90	6
MA3201(5)	Applied Probability	30+0	60	90	6
MA3202(5)	Functional Analysis	30+0	60	90	6

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

Code	Module Name	Contact hrs (L/T+P)	Self-Study hrs	Other Learning Activities/hrs	LCCS Credits
MA1001(1)	Financial Mathematics I	30+0	60	90	6
MA1002(1)	Applied Mathematics II	30+0	60	90	6
MA1003(1)	Descriptive Statistics	30+0	60	90	6
MA2001(3)	Group Theory	30+0	60	90	6
MA2002(3)	Discrete Mathematics	30+0	60	90	6
MA2003(3)	Vector & Tensor Analysis	30+0	60	90	6
MA2005(3)	Mathematical Methods II	30+0	60	90	6
MA3001(5)	Operational Research	30+0	60	90	6
MA3003(5)	Numerical Solution of PDEs	30+0	60	90	6
MA3004(5)	Optimisation	30+0	60	90	6
MA30060(5)	Fluid Dynamics II	30+0	60	90	6
MA3007(5)	Rings & Fields	30+0	60	90	6
MA3008(5)	Topology	30+0	60	90	6
MA30090(5)	Dynamical Systems	30+0	60	90	6
MA3010(5)	Mathematical Modelling	30+0	60	90	6

Note: Contact Hours: L= Lectures, T=Tutorials, P = Practicals

9. PROGRAMME PLAN - BSc (Hons) MATHEMATICS

YEAR 1

Semester 1 Code	Module Name	Hrs/wk. L/T+P	LCCS Credits	Semester 2 Code	Module Name	Hrs/wk. L/T+P	LCCS Credits
CORE				**CORE**			
MA1101(1)	Mathematical Techniques I	3+0	6	MA1201(1)	Mathematical Techniques II	3+0	6
MA1102(1)	Mathematical Analysis I	3+0	6	MA1202(1)	Mathematical Analysis II	3+0	6
MA1103(1)	Applied Mathematics I	3+0	6	MA1203(1)	Mathematical Computing	2+2	6
MA1104(1)	Algebra	3+0	6	MA1208(1)	Advanced Spreadsheet Modelling and Simulation	2+2	6
MA1105(1)	Probability & Statistics	3+0	6	**AT LEAST TWO ELECTIVES FROM:**			
MA1108(1)	Spreadsheet Modelling	2+2	6	MA1001(1)	Financial Mathematics I	3+0	6
				MA1002(1)	Applied Mathematics II	3+0	6
				MA1003(1)	Descriptive Statistics	3+0	6
					Sub Total		**72**

YEAR 2

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits
CORE				**CORE**			
MA2101(3)	Numerical Analysis I	3+0	6	MA2202(3)	Linear Programming	3+0	6
MA2102(3)	Mathematical Methods I	3+0	6	MA2203(3)	Linear Regression Analysis	3+0	6
MA2103(3)	Mathematical Statistics	3+0	6	MA2204(3)	Numerical Analysis II	3+0	6
MA2104(3)	Complex Analysis	3+0	6	MA2205(3)	Numerical Linear Algebra	3+0	6
MA2108(3)	Linear Algebra	3+0	6	MA2208(3)	Metric Spaces	3+0	6
NOTE: AT LEAST TWO ELECTIVES FROM:							
MA2001(3)	Group Theory	3+0	6	MA2003(3)	Vector & Tensor Analysis	3+0	6
MA2002(3)	Discrete Mathematics	3+0	6	MA2005(3)	Mathematical Methods II	3+0	6
					Sub Total		**72**

YEAR 3

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits
CORE				**CORE**			
MA3000Y(5)	Project	-	14				
MA3101(5)	Measure and Integral	3+0	6	MA3201(5)	Applied Probability	3+0	6
MA3102(5)	Fluid Dynamics I	3+0	6	MA3202(5)	Functional Analysis	3+0	6
NOTE: AT LEAST THREE ELECTIVES FROM							
MA3001(5)	Operational Research	3+0	6	MA3007(5)	Rings & Fields	3+0	6
MA3003(5)	Numerical Solution of PDEs	3+0	6	MA3008(5)	Topology	3+0	6
MA3004(5)	Optimisation	3+0	6	MA3009(5)	Dynamical Systems	3+0	6
MA3006(5)	Fluid Dynamics II	3+0	6	MA3010(5)	Mathematical Modelling	3+0	6
					Sub Total		**56**

Grand Total   **200**

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

BSc (Hons) MATHEMATICS WITH STATISTICS / FULL TIME (UNDER REVIEW) - SC320b

1.   CONTEXT AND 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.
- to equip students with both soft and hard skills such as transferable problem solution, reflective and analytical skills with the aid of technology and computing based teaching and learning process.

2.   LEARNING OUTCOMES

At the end of the Programme, Learners will be able to:

Educational Aims

- To provide a balanced foundation of theory and practical skills in mathematics and statistics
- To give students training in methods for problem analysis with computing as a learning and problem solving tool

Knowledge & Understanding

- An ability to independently expand their mathematical and statistical base and acquire advanced knowledge
- Acquire theoretical and operational knowledge and understanding of the core areas of the Programme
- Develop the ability to evaluate mathematical arguments
- Build Confidence in Mathematical and Statistical skills and knowledge
- Awareness of career opportunities in Mathematics and Statistics

Cognitive Skills

- Gain versatility to work effectively in range of areas requiring analytic and computing skills
- Develop proficiency in the use of computer programming in Mathematics and Statistics
- Appreciation for the dynamic role of Mathematics and Statistics in science, society and history
- Formulate algorithmic solutions to mathematical problems

Transferable Skills

- Recognize and appreciate the connections between theory and applications
- Acquire the skills in the oral and written communication of Mathematical and Statistical ideas
- Desire for continuous and independent learning
- Capability to undertake research work, summarise and understand mathematical topics using appropriate referencing styles.

Professional/Practical Skills

- Approach sources of data and other information with an open but critical mind, analysing them thoroughly using appropriate techniques and software
- Use computers and IT for scientific presentation and reporting

3. TEACHING AND LEARNING METHODS

Modules shall be taught over 10 weeks and shall include 3 hours of contact per week, involve 6 hours of self-study per week and 9 hours of other learning activities per week for each semester. The 30 hours of contact shall include class hours, tutorials and practicals.

- By its nature, mathematics has to be presented logically. Lectures and model examples to problems provide an insight of this logical structure. Lectures provide the core method for the presentation of the knowledge required for students to be successful.
- Tutorial problems and assignments enhance the student's logical reasoning skills and additionally develop skills in organising their reasoning, selection of techniques and application of mathematics for problem solving.
- Projects (Mini and final year) will offer the students the opportunity to identify what it takes to carry out a longer individual/ group-based investigation into the applications of Mathematics and Statistics at work.
- Communication through reports and/or oral presentations forms part of some of the modules offered.
- Basic computer modelling skills are developed through the mathematical modelling modules with the use of appropriate software.

4. ENTRY REQUIREMENTS

(a) *General Requirements*

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

(b) *Programme (Specific) Requirements*

Minimum Grade 'C' in Mathematics at GCE 'A' level.

5. PROGRAMME DURATION

	Normal	Maximum
Degree	3 Years (6 semesters)	5 Years (10 semesters)

6. MINIMUM LCCS CREDITS REQUIRED:

Minimum LCCS credits Required for Award of Undergraduate Degree: 200

Breakdown as follows:

Degree	LCCS Credits Core Taught Modules	LCCS Credits Project	LCCS Credits Electives
BSc (Hons) Mathematics with Statistics	150	14	**Minimum 36**[a, b, c]

[a] 12 LCCS credits from year 1 electives,

[b] at least 6 LCCS credits from year 2,

[c] at least 18 LCCS credits from year 3.

LCCS credits per Semester:

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

7. ASSESSMENT AND DEADLINES

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

Written examinations accounting for 60%, will be carried out at the end of the semester in which they are taught.

The continuous assessment will count for 40% 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 class test.

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

Projects/Dissertations will carry 14 LCCS credits for degree award.

The following modules will be assessed solely by continuous assessment:

MA1108(1), MA1203(1), MA1208(1)

8. LIST OF MODULES

C. Core Modules (150 + 14 LCCS credits)

Code	Module Name	Contact Hrs L/T+P	Self-Study /hrs	Other Learning Activities /hrs	LCCS Credits
MA1101(1)	Mathematical Techniques I	30+0	60	90	6
MA1102(1)	Mathematical Analysis I	30+0	60	90	6
MA1103(1)	Applied Mathematics I	30+0	60	90	6
MA1104(1)	Algebra	30+0	60	90	6
MA1105(1)	Probability & Statistics	30+0	60	90	6
MA1108(1)	Spreadsheet Modelling	20+20	60	80	6
MA1201(1)	Mathematical Techniques II	30+0	60	90	6
MA1202(1)	Mathematical Analysis II	30+0	60	90	6
MA1203(1)	Mathematical Computing	20+20	60	80	6
MA1208(1)	Advanced Spreadsheet Modelling and Simulation	20+20	60	80	6
MA2101(3)	Numerical Analysis I	30+0	60	90	6
MA2102(3)	Mathematical Methods I	30+0	60	90	6
MA2103(3)	Mathematical Statistics	30+0	60	90	6
MA2104(3)	Complex Analysis	30+0	60	90	6
MA2107(3)	Survey Sampling	30+0	60	90	6
MA2108(3)	Linear Algebra	30+0	60	90	6
MA2202(3)	Linear Programming	30+0	60	90	6
MA2203(3)	Linear Regression Analysis	30+0	60	90	6
MA2205(3)	Numerical Linear Algebra	30+0	60	90	6
MA2207(3)	Design and Analysis of Experiments	30+0	60	90	6
MA2208(3)	Metric Spaces	30+0	60	90	6
MA3000Y(5)	Project	-			14
MA3204(5)	Risk Analysis II	30+0	60	90	6
MA3105(5)	Financial Derivatives	30+0	60	90	6
MA3201(5)	Applied Probability	30+0	60	90	6
MA3204(5)	Stochastic Calculus	30+0	60	90	6

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

Code	Module Name	Contact Hrs L/T+P	Self-Study /hrs	Other Learning Activities /hrs	LCCS Credits
MA1001(1)	Financial Mathematics	30+0	60	90	6
MA1003(1)	Descriptive Statistics	30+0	60	90	6
MA1004(1)	Simulation Modelling and Analysis	30+0	60	90	6
MA2007(3)	Survival Analysis	30+0	60	90	6
MA2008(3)	Statistical Quality Control	30+0	60	90	6
MA2009(3)	Actuarial Mathematics	30+0	60	90	6
MA2209(3)	Risk Analysis I	30+0	60	90	6
MA3005(5)	Statistical Methods for Finance	30+0	60	90	6

MA3011(5)	Time Series Analysis I	30+0	60	90	6
MA3012(5)	Geostatistics	30+0	60	90	6
MA3013(5)	Statistical Methods for Data Mining	30+0	60	90	6
MA3015(5)	Bayesian Statistics	30+0	60	90	6
MA3016(5)	Game Theory	30+0	60	90	6
MA3017(5)	Time Series Analysis II	30+0	60	90	6
MA3019(5)	Computational Statistics	30+0	60	90	6

Note: Contact Hours: L= Lectures, T=Tutorials, P = Practicals

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9. PROGRAMME PLAN – BSc (Hons) MATHEMATICS WITH STATISTICS

YEAR 1

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS credits
CORE				**CORE**			
MA1101(1)	Mathematical Techniques I	3+0	6	MA1201(1)	Mathematical Techniques II	3+0	6
MA1102(1)	Mathematical Analysis I	3+0	6	MA1202(1)	Mathematical Analysis II	3+0	6
MA1103(1)	Applied Mathematics I	3+0	6	MA1203(1)	Mathematical Computing	2+2	6
MA1104(1)	Algebra	3+0	6	MA1208(1)	Advanced Spreadsheet Modelling and Simulation	2+2	6
MA1105(1)	Probability & Statistics	3+0	6	**AT LEAST TWO ELECTIVES FROM:**			
MA1108(1)	Spreadsheet Modelling	2+2	6	MA1001(1)	Financial Mathematics I	3+0	6
				MA1003(1)	Descriptive Statistics	3+0	6
				MA1004(1)	Simulation Modelling and Analysis	3+0	6
					Sub Total		**72**

YEAR 2

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS credits
CORE				**CORE**			
MA2101(3)	Numerical Analysis I	3+0	6	MA2202(3)	Linear Programming	3+0	6
MA2102(3)	Mathematical Methods I	3+0	6	MA2203(3)	Linear Regression Analysis	3+0	6
MA2103(3)	Mathematical Statistics	3+0	6	MA2205(3)	Numerical Linear Algebra	3+0	6
MA2104(3)	Complex Analysis	3+0	6	MA2207(3)	Design and Analysis of Experiments	3+0	6
MA2107(3)	Survey Sampling	3+0	6	MA2208(3)	Metric Spaces	3+0	6
MA2108(3)	Linear Algebra	3+0	6				
NOTE: AT LEAST ONE ELECTIVE FROM:							
MA2007(3)	Survival Analysis	3+0	6	MA2009(3)	Actuarial Mathematics	3+0	6
MA2008(3)	Statistical Quality Control	3+0	6	MA2209(3)	Risk Analysis I	3+0	6
					Sub Total		**72**

YEAR 3

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS credits
CORE				**CORE**			
MA3000Y(5)	Project	-	14	MA3201(5)	Applied Probability	3+0	6
MA3101(5)	Measure and Integral	3+0	6	MA3203(5)	Multivariate Analysis	3+0	6
MA3103(5)	Generalised Linear Models	3+0	6				
NOTE: AT LEAST THREE ELECTIVES FROM:							
MA3005(5)	Statistical Methods for Finance	3+0	6	MA3015(5)	Bayesian Statistics	3+0	6
MA3011(5)	Time Series Analysis I	3+0	6	MA3016(5)	Game Theory	3+0	6
MA3012(5)	Geostatistics	3+0	6	MA3017(5)	Time Series Analysis II	3+0	6
MA3013(5)	Statistical Methods for Data Mining	3+0	6	MA3019(5)	Computational Statistics	3+0	6
					Sub Total		**56**
					Grand Total		**200**

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

BSc (Hons) MATHEMATICS WITH FINANCE / FULL TIME - (UNDER REVIEW) - SC320c

1. CONTEXT AND 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 and Finance degree provides the necessary background to succeed in today's financial industry as quants, financial engineers 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 suitable both 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. LEARNING OUTCOMES

At the end of the programme Learners will be able to:

Knowledge & Understanding

- Demonstrate a thorough understanding of core mathematical principles and understand and appreciate the importance of mathematical logic
- Demonstrate an understanding of the fundamental concepts and techniques of calculus, analysis, algebra, linear algebra and numerical methods
- Ability to apply this understanding within a range of more specialist optional topics with an emphasis on financial problems
- Use the fundamental mathematical concepts and techniques in areas such as partial differential equations, mechanics, numerical analysis, statistics and operational research

Cognitive Skills

- Apply mathematical knowledge logically and accurately in the solution of examples and real life problems
- Conduct a mathematical investigation within finance
- Analyse problems and situations in finance in mathematical terms, and identify the appropriate mathematical tools and techniques for their solution
- Organise their work in a structured manner

Transferable Skills
- Ability to research, summarise and understand mathematical topics and to reference it in an academically rigorous way
- Manage time and oversee projects, both individual and team-oriented
- Use computer technology efficiently for a variety of purposes

- Communicate mathematical ideas and concepts and present findings through oral and written means to a range of audience.
- Adopt an analytic approach to problem solving

Professional/Practical Skills

- Demonstrate understanding of logical mathematical arguments, including mathematical proofs and their construction, and apply these arguments appropriately
- Use a range of mathematical software for the solution of mathematical and finance problems
- Use computers and IT for data analysis and presentation, scientific computation and general purpose applications

3. TEACHING AND LEARNING METHODS

Modules shall be taught over 10 weeks and shall include 3 hours of contact per week, involve 6 hours of self-study per week and 9 hours of other learning activities per week for each semester. The 30 hours of contact shall include class hours, tutorials and practicals.

- By its nature, mathematics has to be presented logically. Lectures and model examples to problems provide an insight of this logical structure. Lectures provide the core method for the presentation of the knowledge required for students to be successful.
- Tutorial problems and assignments enhance the student's logical reasoning skills and additionally develop skills in organising their reasoning, selection of techniques and application of mathematics for problem solving.
- Projects (Mini and final year) will offer the students the opportunity to identify what it takes to carry out a longer individual/ group-based investigation into the applications of mathematics within a finance/business environment.
- Communication through reports and/or oral presentations forms part of some of the modules offered.
- Basic computer modelling skills are developed through the mathematical modelling modules with the use of appropriate software.

4. ENTRY REQUIREMENTS
- *General Requirements*
  General: As per General Entry Requirements for admission to the University for undergraduate degrees.
- *Programme (Specific) Requirements*
  Programme (Specific): Minimum Grade 'C' in Mathematics at GCE 'A' level.

5. PROGRAMME DURATION

	Normal	**Maximum**
Degree	3 years (6 semesters)	5 years (10 semesters)

6. MINIMUM LCCS CREDITS REQUIRED:

Minimum LCCS credits required for Award of Undergraduate Degree: 200

Breakdown as follows:

Degree	LCCS Credits Core Taught Modules	LCCS Credits Project	LCCS Credits Electives
BSc (Hons) Mathematics with Finance	144	14	Minimum 42[a,b,c]

[a] 12 LCCS credits from year 1 electives
[b] 12 LCCS credits from year 2 electives
[c] 18 LCCS credits from year 3 electives.

LCCS credits per Semester

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

7.   ASSESSMENT AND DEADLINES

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

Written examinations accounting for 60%, will be carried out at the end of the semester in which they are taught.

The continuous assessment will count for 40% 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 class test.

An overall total of 40% is required for a candidate to pass a module.
Projects/Dissertations will carry 14 LCCS credits for degree award.

The following modules will be assessed solely by continuous assessment:

MA1108(1)
MA1203(1)
MA1208(1)

8. LIST OF MODULES

A. Core Modules (144 + 14 LCCS credits)

Code	Module Name	Contact hrs L/T+P	Self-Study/ hrs	Other Learning Activities/hrs	LCCS Credits
MA1101(1)	Mathematical Techniques I	30+0	60	90	6
MA1102(1)	Mathematical Analysis I	30+0	60	90	6
MA1103(1)	Applied Mathematics I	30+0	60	90	6
MA1104(1)	Algebra	30+0	60	90	6
MA1105(1)	Probability & Statistics	30+0	60	90	6
MA1108(1)	Spreadsheet Modelling	20+20	60	80	6
MA1201(1)	Mathematical Techniques II	30+0	60	90	6
MA1202(1)	Mathematical Analysis II	30+0	60	90	6
MA1203(1)	Mathematical Computing	20+20	60	80	6
MA1208(1)	Advanced Spreadsheet Modelling and Simulation	20+20	60	80	6
MA2101(3)	Numerical Analysis I	30+0	60	90	6
MA2102(3)	Mathematical Methods I	30+0	60	90	6
MA2103(3)	Mathematical Statistics	30+0	60	90	6
MA2108(3)	Linear Algebra	30+0	60	90	6
MA2202(3)	Linear Programming	30+0	60	90	6
MA2203(3)	Linear Regression Analysis	30+0	60	90	6
MA2206(3)	Fixed Income Analysis	30+0	60	90	6
MA2209(3)	Risk Analysis I	30+0	60	90	6
DFA2002Y(3)	Corporate Finance	30+0	60	90	12
MA3000Y(5)	Project	-			14
MA3204(5)	Risk Analysis II	30+0	60	90	6
MA3105(5)	Financial Derivatives	30+0	60	90	6
MA3201(5)	Applied Probability	30+0	60	90	6
MA3204(5)	Stochastic Calculus	30+0	60	90	6

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

Code	Module Name	Contact hrs	Self-Study/ hrs	Other Learning Activities/hrs	LCCS Credits
ACF1000(1)	Accounting for Financial Decision Making	30+0	60	90	6
ACF1002(1)	Principles of Finance	30+0	60	90	6
MA1001(1)	Financial Mathematics	30+0	60	90	6
MA2006(3)	Alternative Investments	30+0	60	90	6
MA2009(3)	Actuarial Mathematics	30+0	60	90	6
DFA2012Y(3)	Portfolio Theory & Fixed Income Securities	30+0	60	90	12
MA3005(5)	Statistical Methods for Finance	30+0	60	90	6
MA3011(5)	Time Series Analysis I	30+0	60	90	6
MA3017(5)	Time Series Analysis II	30+0	60	90	6
MA3018(5)	Discrete Time Finance	30+0	60	90	6
DFA3006Y(5)	International Finance	30+0	60	90	12

Note: Contact Hours: L= Lectures, T=Tutorials, P = Practicals

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9. PROGRAMME PLAN - BSc (Hons) MATHEMATICS WITH FINANCE

YEAR 1

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits
CORE				**CORE**			
MA1101(1)	Mathematical Techniques I	3+0	6	MA1201(1)	Mathematical Techniques II	3+0	6
MA1102(1)	Mathematical Analysis I	3+0	6	MA1202(1)	Mathematical Analysis II	3+0	6
MA1103(1)	Applied Mathematics I	3+0	6	MA1203(1)	Mathematical Computing	2+2	6
MA1104(1)	Algebra	3+0	6	MA1208(1)	Advanced Spreadsheet Modelling and Simulation	2+2	6
MA1105(1)	Probability & Statistics	3+0	6	**AT LEAST TWO ELECTIVES FROM:**			
MA1108(1)	Spreadsheet Modelling	2+2	6	MA1001(1)	Financial Mathematics	3+0	6
				ACF1000(1)	Accounting for Financial Decision Making	3+0	6
				ACF1002(1)	Principles of Finance	3+0	6
					Subtotal		**72**

YEAR 2

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits
CORE				**CORE**			
MA2101(3)	Numerical Analysis I	3+0	6	MA2202(3)	Linear Programming	3+0	6
MA2102(3)	Mathematical Methods I	3+0	6	MA2203(3)	Linear Regression Analysis	3+0	6
MA2103(3)	Mathematical Statistics	3+0	6	MA2206(3)	Fixed Income Analysis	3+0	6
MA2108(3)	Linear Algebra	3+0	6	MA2209(3)	Risk Analysis I	3+0	6
DFA2002Y(3)	Corporate Finance	3+0	12				

NOTE: AT LEAST 12 LCCS CREDITS FROM THE FOLLOWING ELECTIVES:

DFA2012Y(3)	Portfolio Theory & Fixed Income Securities	3+0	12	MA2009(3)	Actuarial Mathematics	3+0	6
MA2006(3)	Alternative Investments	3+0	6		**Subtotal**		**72**

YEAR 3

Semester 1 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits	Semester 2 Code	Module Name	Hrs/Wk L/T+P	LCCS Credits
CORE				**CORE**			
MA3000Y(5)	Project	-	14				
MA3104(5)	Risk Analysis II	3+0	6	MA3201(5)	Applied Probability	3+0	6
MA3105(5)	Financial Derivatives	3+0	6	MA3204(5)	Stochastic Calculus	3+0	6

NOTE: AT LEAST 18 LCCS CREDITS FROM THE FOLLOWING ELECTIVES:

MA3005(5)	Statistical Methods for Finance	3+0	6	MA3017(5)	Time Series Analysis II	3+0	6
MA3011(5)	Time Series Analysis I	3+0	6	MA3018(5)	Discrete Time Finance	3+0	6
DFA3006Y(5)	International Finance	3+0	12		**Sub Total**		**56**
					Grand Total		**200**

Note

1. *Electives may be offered in either semester 1 or 2 & not all electives may be on offer.*
2. *Students should register for ACF 1000(1) and ACF1002(1) as electives in Year I.*