UNIVERSITY OF Southampton

Addendum to the Programme Specification

4714 MMath Master of Mathematics/ 6154 MMath Master of Mathematics with Statistics

This Addendum has been produced to highlight the key changes made to the existing Programme Specification as a result of the University's response to the Covid-19 Pandemic. You should read it in conjunction with the relevant Programme Specification from the year you started your programme.

Programme Specification for entry in 2020-21
Programme Specification for entry in 2019-20
Programme Specification for entry in 2018-19

University level information

In view of COVID-19, the University has had to make changes to some elements of programme delivery for 2020-21. These changes have included the method of delivery, such as face-to-face and online, and the number of modules available.

The University aims to provide as much of a face-to-face component to your education as prevailing conditions at the time allow, combined with its new blended approach that will develop active independent and group online learning.

As the COVID-19 pandemic develops, the University's response to this and other issues may likewise need to evolve. The University will consult with student representatives as necessary and appropriate and will communicate changes to you as soon as practicable so that you have the information you need to understand how a change may impact you and what steps you need to take next. The University remains committed to supporting you as you learn.

Programme Information

In light of Covid-19, teaching and learning methods may be adapted. Lectures, seminars, tutorials, and consultation with academic staff may be delivered online or in person as the prevailing conditions allow. Group sizes for tutorials and seminars may be adjusted. Assessment methods may also be adapted. For example, in-class test may be replaced by assignments, weightings of assessments may change, exams may be replaced by coursework or take-home assignments and group presentations and projects may take place online or be adapted to allow for social distancing guidelines.

Programme Structure

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note that, in some instances, modules have limited spaces available.

Part 1

Semester 1				Semester 2			
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH1048 Linear Algebra I	7.5	15	Core				
MATH1059 Calculus	7.5	15	Core				
MATH1046 First Year Mathematics Workshop					0	0	Comp
MATH1053 TT Personal Tutor meeting					0	0	Comp
MATH1001 Number Theory	7.5	15	Comp	MATH1049 Linear Algebra II	7.5	15	Comp
MATH1024 Introduction to Probability and Statistics	7.5	15	Comp	MATH1057 Dynamics and Relativity	7.5	15	Comp
				MATH1058 Operational Research I and Mathematical Computing	7.5	15	Comp
				MATH1060 Multivariable Calculus	7.5	15	Comp

Part 2

Semester 1				Semester 2			
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH2039 Analysis	7.5	15	Core	MATH2038 Partial Differential Equations	7.5	15	Core
Option Modules **Select 4 modules in total comprising 2 of the following 3 groups.** **Please Note:- Each group contains a pair of modules that must be selected together, so you are choosing to take 2 of the 3 pairs.**							
Select up to 2 modules (15 ECTS/30 CATS). Select both modules if you wish to study the Pure Mathematics pair as your 2 Optional Modules.							
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH2003 Group Theory	7.5	15	Option	MATH2049 Geometry and Topology	7.5	15	Option
Select up to 2 modules (15 ECTS/30 CATS). Select both modules if you wish to study the Applied Mathematics pair as your 2 Optional Modules.							
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH2045 Vector Calculus and Complex Variable	7.5	15	Option	MATH2044 Fields and Fluids	7.5	15	Option
Select up to 2 modules (15 ECTS/30 CATS). Select both modules if you wish to study the Statistics pair as your 2 Optional Modules.							
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH2011 Statistical Distribution Theory	7.5	15	Option	MATH2010 Statistical Modelling I	7.5	15	Option
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
A maximum of 7.5 ECTS/15 CATS in any level NQF4 module in subject MATH.	7.5	15	Option	MATH2012 Stochastic Processes	7.5	15	Option
FREEXY15 Part 2 Elective	7.5	15	Option	MATH2014 Algorithms	7.5	15	Option
MATH2013 Introduction to Operational Research	7.5	15	Option				
MATH2040 Financial Mathematics	7.5	15	Option				

Part 3

Semester 1				Semester 2			
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH3092 Mathematics Project					15	30	Comp

Select 4 - 6 modules (30ECTS/60 CATS – 45ECTS/90CATS) from the following:-
Do NOT select modules you have taken previously.
Please also ensure that you select an even split of credits overall by Semester including your compulsory modules.
If you do not, you will be contacted by your Student Office and asked to amend your choices.

GROUP 1 Actuarial & Financial Modules

Please select 0 up to a maximum of 4 modules (0 – 60 credits) from the following:

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
ECON3010 Topics in Macroeconomics 3	7.5	15	Option	MATH3022 Mathematical Finance	7.5	15	Option
MATH3063 Actuarial Mathematics I	7.5	15	Option	MATH3066 Actuarial Mathematics II	7.5	15	Option
MATH3085 Survival Models	7.5	15	Option	STAT3010 Statistical Methods in Insurance	7.5	15	Option

GROUP 2 Op Res, Mgt Sci & Stat Modules

Please select 0 up to a maximum of 4 modules (0 - 60 credits) from the following:

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MANG3010 Knowledge Management	7.5	15	Option	MANG3034 Project Management	7.5	15	Option
MATH3016 Optimization	7.5	15	Option	MATH3017 Mathematical Programming	7.5	15	Option
MATH3018 Numerical Methods	7.5	15	Option	MATH3091 Statistical Modelling II	7.5	15	Option
MATH3033 Graph Theory	7.5	15	Option	MATH3014 Design and Analysis of Experiments	7.5	15	Option
MATH3044 Statistical Inference	7.5	15	Option				

GROUP 3 Maths & Statistics Modules

Please select 0 up to a maximum of 4 modules (0 – 60 credits) from the following:

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MATH3033 Graph Theory	7.5	15	Option	MATH3006 Relativity, Black Holes and Cosmology	7.5	15	Option
MATH3076 Hilbert Spaces	7.5	15	Option	MATH3052 Mathematical Biology	7.5	15	Option
MATH3083 Advanced Partial Differential Equations	7.5	15	Option	MATH3078 Further Number Theory	7.5	15	Option
MATH3086 Galois Theory	7.5	15	Option	MATH3080 Algebraic Topology	7.5	15	Option
MATH3090 Structure and Dynamic of Networks	7.5	15	Option	MATH3084 Integral Transform Methods	7.5	15	Option
				MATH3088 Complex Analysis	7.5	15	Option

Select 2 modules (15 ECTS/30 CATS) from the following groups:-
Select 0 modules up to a maximum of 1 module (7.5 ECST/15 CATS) from the following:-

Please note you cannot take MATH2049 Geometry and Topology if you have previously taken MATH2046

Note: you are permitted to only 'backtrack' once to take a Part 2 elective

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
FREEXY15 Part 2 Elective	7.5	15	Option	MATH2010 Statistical Modelling I	7.5	15	Option
LANGXX15 Language Module	7.5	15	Option	MATH2012 Stochastic Processes	7.5	15	Option
GEOG3048 Aeolian Landscapes: Modelling and Measuring Aeolian Systems	7.5	15	Option	MATH2014 Algorithms	7.5	15	Option
MATH2003 Group Theory	7.5	15	Option	MATH2044 Fields and Fluids	7.5	15	Option
MATH2011 Statistical Distribution Theory	7.5	15	Option	MATH2049 Geometry and Topology	7.5	15	Option
MATH2013 Introduction to Operational Research	7.5	15	Option				
MATH2040 Financial Mathematics	7.5	15	Option				

Select 1 module up to a maximum of 2 modules (15 ECTS/30 CATS). Select 1 module 7.5 ECTS/15 CATS) up to a maximum of 15 ECTS/30 CATS from the following:							
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
FREEXZ15 Part 3 Elective	7.5	15	Option	STAT3010 Statistical methods in Insurance	7.5	15	Option
LANGXX15 Language Module	7.5	15	Option	15 credits in any level NQF6 module in subject MATH.	7.5	15	Option
LANGXX30 Language Module	7.5	15	Option	15 credits in any level NQF6 module in subject MATH.	7.5	15	Option

Year 4

Semester 1				Semester 2			
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH6144 MMath Project					15	30	Core
Option Modules: **Select 6 modules (90 credits) from the following:-** **Barred Combinations: Cannot select MATH6163 if MATH3083 has already been taken Cannot select MATH6162 if MATH3084 has already been taken. Cannot select MATH6140 if MATH3090 has already been taken.** **Please ensure that you select an even split of credits overall by Semester including your compulsory modules.**							
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH6079 Hyperbolic Geometry	7.5	15	Option	MATH6094 Complex Function Theory	7.5	15	Option
MATH6095 Introduction to Semigroup Theory	7.5	15	Option	MATH6139 Advanced General Relativity	7.5	15	Option
MATH6109 Differential Geometry and Lie Groups	7.5	15	Option	MATH6149 Modelling with Differential Equations	7.5	15	Option
MATH6138 Geometric Group Theory	7.5	15	Option	MATH6155 Harmonic Analysis	7.5	15	Option
MATH6140 Structure and Dynamics of Networks	7.5	15	Option	MATH6156 Modules and Representations	7.5	15	Option
MATH6163 Advanced Partial Differential Equations	7.5	15	Option	MATH6162 Integral Transform Methods	7.5	15	Option
MATH6172 Gravitational Waves	7.5	15	Option				

6154 MMath with Statistics

Part 1

Semester 1				Semester 2			
Modules	**ECTS**	**CATS**	**Module type**	**Modules**	**ECTS**	**CATS**	**Module Type**
MATH1048 Linear Algebra I	7.5	15	Core				
MATH1059 Calculus	7.5	15	Core				
MATH1046 First Year Mathematics Workshop					0	0	Comp
MATH1053 TT Personal Tutor meeting					0	0	Comp
MATH1001 Number Theory	7.5	15	Comp	MATH1049 Linear Algebra II	7.5	15	Comp
MATH1024 Introduction to Probability and Statistics	7.5	15	Comp	MATH1057 Dynamics and Relativity	7.5	15	Comp
				MATH1058 Operational Research I and Mathematical Computing	7.5	15	Comp
				MATH1060 Multivariable Calculus	7.5	15	Comp

Part 2

Semester 1	Semester 2

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MATH2039 Analysis	7.5	15	Comp	MATH2010 Statistical Modelling I	7.5	15	Comp
MATH2011 Statistical Distribution Theory	7.5	15	Comp	MATH2012 Stochastic Processes	7.5	15	Comp
				MATH2038 Partial Differential Equations	7.5	15	Comp

Option Modules

Select 3 modules in total comprising 2 of the following 3 groups.
Please Note:- Each group contains a pair of modules that must be selected together, so you are choosing to take 2 of the 3 pairs.

Select up to 2 modules (15 ECTS/30 CATS). Select both modules if you wish to study the Pure Mathematics pair as your 2 Optional Modules.

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MATH2003 Group Theory	7.5	15	Option	MATH2049 Geometry and Topology	7.5	15	Option

Select up to 2 modules (15 ECTS/30 CATS). Select both modules if you wish to study the Applied Mathematics pair as your 2 Optional Modules.

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MATH2045 Vector Calculus and Complex Variable	7.5	15	Option	MATH2044 Fields and Fluids	7.5	15	Option

Select 1 module (7.5 ECTS/15 CATS) from the following:-

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
A maximum of 7.5 ECTS/15 CATS in any level NQF4 module in subject MATH.	7.5	15	Option	MATH2014 Algorithms	7.5	15	Option
FREEXY15 Part 2 Elective	7.5	15	Option	MATH2044 Fields and Fluids	7.5	15	Option
MATH2003 Group Theory	7.5	15	Option	MATH2049 Geometry and Topology	7.5	15	Option
MATH2013 Introduction to Operational Research	7.5	15	Option				
MATH2040 Financial Mathematics	7.5	15	Option				
MATH2045 Vector Calculus and Complex Variable	7.5	15	Option				

Part 3

Semester 1				Semester 2			
Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MATH3044 Statistical Inference	7.5	15	Comp	MATH3091 Statistical Modelling II	7.5	15	Comp
				MATH3014 Design and Analysis of Experiments	7.5	15	Comp
MATH3092 Mathematics Project					15	30	Comp

Select 45CATS
Please do not select modules you have taken previously.
Please also ensure that you select an even split of credits overall by semester, including your compulsory modules. If you do not, you will be contacted by your Student Office and asked to amend your choices.

GROUP 1 Please select between 0 and 15 credits from the following:

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
FREEXY15 Part 2 Elective	7.5	15	Option	FREEXY15 Part 2 Elective	7.5	15	Option
MATH2003 Group Theory	7.5	15	Option	MATH2012 Stochastic Processes	7.5	15	Option
MATH2013 Operational Research II	7.5	15	Option	MATH2014 Algorithms	7.5	15	Option
MATH2040 Financial Mathematics	7.5	15	Option	MATH2044 Fields and Fluids	7.5	15	Option
MATH2045 Vector Calculus and Complex Variable	7.5	15	Option	MATH2049 Geometry and Topology	7.5	15	Option

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
UOSM2004 Global Health	7.5	15	Option	UOSM2001 Business Skills for Employability	7.5	15	Option

GROUP 2

Please select 15 CATS up to 45 CATS from the following

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MATH3016 Optimization	7.5	15	Option	MATH3006 Relativity, Black Holes and Cosmology	7.5	15	Option
MATH3018 Numerical Methods	7.5	15	Option	MATH3022 Mathematical Finance	7.5	15	Option
MATH3033 Graph Theory	7.5	15	Option	MATH3052 Mathematical Biology	7.5	15	Option
MATH3063 Actuarial Mathematics I	7.5	15	Option	MATH3066 Actuarial Mathematics II	7.5	15	Option
MATH3076 Hilbert Spaces	7.5	15	Option	MATH3078 Further Number Theory	7.5	15	Option
MATH3083 Advanced Partial Differential Equations	7.5	15	Option	MATH3080 Algebraic Topology	7.5	15	Option
MATH3085 Survival Models	7.5	15	Option	MATH3084 Integral Transform Methods	7.5	15	Option
MATH3086 Galois Theory	7.5	15	Option	MATH3088 Complex Analysis	7.5	15	Option
MATH3090 Structure and Dynamics of Networks	7.5	15	Option	MATH3017 Mathematical Programming	7.5	15	Option

Select up to 1 module 7.5 ECTS/15 CATS) from the following:

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
FREEXZ15 Part 3 Elective	7.5	15	Option	STAT3010 Statistical methods in Insurance	7.5	15	Option
LANGXX15 Language Module	7.5	15	Option	FREEXZ15 Part 3 Elective	7.5	15	Option
LANGXX30 Language Module	7.5	15	Option	LANGXX15 Language Module	7.5	15	Option
				LANGXX30 Language Module	7.5	15	Option

Part 4

Semester 1				Semester 2			
Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
				MATH6168 Machine Learning	7.5	15	Comp
				MATH6169 Flexible Regression	7.5	15	Comp
MATH6144 MMath Project					15	30	Comp

Option Modules:

Please select 30 ECTS/60CATS from the following modules:
Barred Combinations:
Cannot select MATH6127 if MATH3022 has already been taken
Cannot select MATH6129 if MATH3063 has already been taken
Cannot select MATH6130 if MATH3066 has already been taken
Cannot select MATH6141 if MATH3018 has already been taken
Cannot select MATH6163 if MATH3083 has already been taken
Cannot select MATH6162 if MATH3084 has already been taken
Cannot select MATH6140 if MATH3090 has already been taken
Cannot select MATH6143 if MATH3085 has already been taken

Modules	ECTS	CATS	Module type	Modules	ECTS	CATS	Module Type
MATH6079 Hyperbolic Geometry	7.5	15	Option	MATH6094 Complex Function Theory	7.5	15	Option
MATH6095 Introduction to Semigroup Theory	7.5	15	Option	MATH6127 Mathematical Finance	7.5	15	Option
MATH6109 Differential Geometry and Lie Groups	7.5	15	Option	MATH6130 Actuarial Mathematics II	7.5	15	Option

MATH6121 Economics	7.5	15	Option	MATH6139 Advanced General Relativity	7.5	15	Option
MATH6129 Actuarial Mathematics I	7.5	15	Option	MATH6149 Modelling with Differential Equations	7.5	15	Option
MATH6138 Geometric Group Theory	7.5	15	Option	MATH6155 Harmonic Analysis	7.5	15	Option
MATH6140 Structure and Dynamics of Networks	7.5	15	Option	MATH6156 Modules and Representations	7.5	15	Option
MATH6141 Numerical Methods	7.5	15	Option	MATH6162 Integral Transform Methods	7.5	15	Option
MATH6143 Survival Models	7.5	15	Option				
MATH6163 Advanced Partial Differential Equations	7.5	15	Option				
MATH6173 Statistical Computing	7.5	15	Option				