Programme Specification

Mathematics with French (2017-18)

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in years	4
Accreditation details	None
Final award	Bachelor of Science with Honours (BSc (Hons))
Name of award	Mathematics with French
Interim Exit awards	Bachelor of Science (Ordinary)
	Certificate of Higher Education (CertHE)
	Diploma of Higher Education (DipHE)
FHEQ level of final award	Level 6
UCAS code	G1R1
Programme code	4742
QAA Subject Benchmark or other external reference	Mathematics, Statistics And Operational Research 2007
Programme Lead	Carlos Lobo (cl2u07)

Programme Overview

Brief outline of the programme

As people in different countries in Europe and in the world work together more and more closely, it is important to understand from first-hand experience how other countries and cultures work, and to be comfortable in a foreign language and culture. At the same time, business, political decision making, public and private sector management and the social sciences are becoming more quantitative in their methods. Mathematical models and simulations, in the widest sense, are crucial in ever more lines of work. Therefore combining the study of mathematics with that of a foreign language and culture, and a year of study abroad, gives you an excellent preparation for your work after university. This is a four year Programme in which the third year is normally spent abroad in a country where the language of study is spoken (normally in a Mathematics Department of a University).

Transfer to this programme is normally only possible early in Semester 1 from a number of other programmes

within Mathematical Sciences.

Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles.

Learning and teaching

The Mathematical Sciences academic unit uses a wide variety of modern learning and teaching methods involving small group tutorial work and computer based learning that builds on what you learn in lectures.

Assessment

Assessment is varied enabling you to demonstrate your strengths and show what you have learnt. Students are provided with access to relevant software that they can use on their own personal computers to assist their studies.

Special Features of the programme

Students are required to spend the third year abroad in a country where the language of study is normally spoken.

This period is normally spent in a mathematics department of an ERASMUS Partner University.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

The aims of the programme are to:

- Introduce you to the main basic areas of mathematics;
- Develop your understanding of abstract mathematical concepts;
- Offer you the opportunity to study advanced mathematical concepts and techniques;
- Develop your modelling and problem solving skills;
- Offer you the opportunity to construct an individual programme of study within a coherent framework;
- Offer you the opportunity to study applications of mathematics in a variety of contexts which utilize mathematical and statistical models;
- Provide the opportunity for learning mathematics in a foreign language;
- Provide the opportunity for developing fluency in a modern language;
- Encourage the development of understanding of the culture of the country in which the language is studied by living there.
- Develop your subject specific and transferable skills including an analytical approach to problem solving, logical argument and deductive reasoning, abstraction and generalisation, and written communication skills in mathematics;
- Provide some of the basic IT skills necessary for further study and employment, including word processing and use of the internet;
- Help you to develop key skills: personal organisation, teamwork, problem solving and analysis, finding and using information, and written and oral presentation.

Programme Learning Outcomes

Knowledge and Understanding

On successful completion of this programme a student will have knowledge and understanding of:

A1. The fundamentals of calculus, linear algebra, and statistics;

A2. The fundamentals of ordinary differential equations and their applications;

A3. The principles of mathematical proof and some of the techniques of proof;

A4. The fundamental concepts of real analysis of functions of one variable;

A5. The language and culture of the country visited.

Teaching and Learning Methods

Acquisition of knowledge and understanding of A1 through A5 is through structured exposition based on lectures, tutorial classes, workshops and private study, all of which are equally important. Increasing independence of learning is required as the programme progresses. In the Modern Language components group work plays an important part, and independent study uses a range of electronic and printed resources (A5).

Throughout the programme you are encouraged to use additional recommended reading material for private study to consolidate the formal learning process, and to broaden and deepen your understanding.

Assessment Methods

Assessment is undertaken in the first year by a mixture of unseen examinations, regular marked coursework, class tests, together with a small component of project work. This variety of assessment relates A1 through A5, and also to some of the skills described below. This varied approach to assessment continues in the remainder of the programme, with the relative emphasis depending on the options chosen.

Subject Specific Intellectual and Research Skills

On successful completion of this programme a student will be able to:

B1. The mathematical problem-solving skills for certain types of problems and their variants in a variety of mathematical contexts;

B2. The ability to undertake algebraic calculations accurately and with understanding;

B3. The ability to use computer packages (for example, R) as vehicles for mathematical exploration and understanding;

B4. The ability to understand and to construct mathematical proofs;

B5. The ability to appreciate, construct and analyse mathematical models of practical situations;

B6. The ability to handle the four skills of reading, writing, listening and speaking the relevant language at the highest level.

Teaching and Learning Methods

Problem-solving is at the heart of all mathematical activity, and so it is emphasised throughout the learning and teaching experience, as is the need for accurate calculation and logical argument. The use of specific mathematical and computational packages is a part of the curriculum, and the skills acquired there are used in later modules as appropriate. In the Division of Modern Languages learning takes place also in the interaction with language teachers and in class discussions, in formal presentations, and through independent work using a variety of materials.

Assessment Methods

The various methods of assessment described in Knowledge and Understanding section involve problem-solving (B1) in addition to the assessment of knowledge and understanding (B2, B4 through B6). Fluency in computer packages (B3) is assessed by coursework.

Transferable and Generic Skills

On successful completion of this programme a student will be able to:

C1. Communicate mathematical ideas in written form;

C2. Undertake oral presentations;

C3. Demonstrate group-working skills;

C4. Use email, spreadsheets and show basic word processing skills;

C5. Use and obtain information from a variety of different sources including the internet, books and other printed material;

C6. Use the skills you have acquired (e.g. time-management, organisation, problem-solving, critical analysis, independent learning, etc.) for life-long learning;

C7. Express ideas clearly in various registers of language.

Teaching and Learning Methods

Mathematics Workshops are offered during the first and second years, and extensive electronic

resources on study skills are available through the Mathematics and University websites.

Further development of IT skills, written communication and general skills such as organisation and time- management is associated to optional second and third year modules which may have an element of coursework in their assessment. The second and third year project based modules develop your portfolio of skills to include internet and library research, group working, and presentation skills.

Assessment Methods

Throughout the programme the clear communication of mathematics is part of the assessment criteria, either explicitly or implicitly. For project work, and for those modules which involve coursework assignments, a proportion of the assessment is allocated to communication (C1, C2, and C4). Project work and coursework assessment also relate to C5, and where appropriate, C3. The skills referred to in C6 refer to problem-solving, an integral component of all mathematical work, and other learning skills are implicit. Those skills in C7 are assessed particularly through oral language work, and in essay assignments, which have to be word-processed.

Programme Structure

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Part I

Typical programme content

This is a four year programme in which the third year is normally spent abroad in a country where the language of study is normally spoken (normally in a Mathematics Department of a University).

In addition to this, our Curriculum Innovation Programme offers our students the chance to take optional modules outside their core disciplines. This allows you to personalise your education, to develop new skills and knowledge for your future.

Programme details

The structure of the programme and the modules currently offered are set out below. Of the modules shown against each part of your programme, some are compulsory (ie enrolment is automatic) and others are optional. Against each part, you are directed to which modules are compulsory and which are optional. The optional modules listed constitute an indicative list. There will always be choice but the options might vary between parts. A list of optional modules will be available to you via the Student Record Self-Service system once you enrol at the University.

The programme comprises four parts, each corresponding to one year of full-time study. You will normally have to take 4 modules (30 ECTS/60 CATS) each semester (ie 8 modules (60 ECTS/120 CATS) in each year of the programme

(apart from the year abroad). Each credit can be considered as the equivalent of approximately ten hours of study. All the modules offered in this programme (except the dissertation) are 7.5 ECTS/15 CATS modules. This means that each module comprises around 150 hours of study divided into contact time (e.g. lectures, seminars, workshops) and non-contact time when you will be engaged in directed study (preparation for classes) and independent study when you will be involved in producing assignments and preparing and taking examinations.

The Investigative Project Abroad accounts for 15 ECTS/30 CATS points in the year while mathematics modules at the host university account for the equivalent of 45 ECTS/90 CATS points.

The option modules shown below constitute an indicative list; there will always be choice but the options might vary between years. A full list of modules and rules will be available to you via the Student Record Self-Service system once you enrol at the University

Part I Compulsory

Code	Module Title	ECTS	Type
MATH1024	Introduction to Probability and Statistics	7.5	Compulsory
MATH1049	Linear Algebra II	7.5	Compulsory
MATH1060	Multivariable Calculus	7.5	Compulsory

Part I Core

Code	Module Title	ECTS	Type
MATH1059	Calculus	7.5	Core
FREN9010	French Language Stage 4	15	Core
MATH1048	Linear Algebra I	7.5	Core

Part I Optional

Code	Module Title	ECTS	Type
MATH1057	Dynamics and Relativity	7.5	Optional
MATH1058	Operational Research I and Mathematical Computing	7.5	Optional

Part II

Part II Compulsory

Code	Module Title	ECTS	Type
MATH2039	Analysis	7.5	Compulsory
LANG2010	Managing Research and Learning	0	Compulsory
MATH2038	Partial Differential Equations	7.5	Compulsory

Part II Core

Code	Module Title	ECTS	Type
FREN9011	French Language Stage 5	15	Core

Part II Optional

Code	Module Title	ECTS	Type
MATH2014	Algorithms	7.5	Optional
MATH2044	Applications of Vector Calculus	7.5	Optional
MATH2049	Geometry and Topology	7.5	Optional
MATH2003	Group Theory	7.5	Optional
MATH2008	Introduction to Applied Mathematics	7.5	Optional
MATH2011	Statistical Distribution Theory	7.5	Optional
MATH2010	Statistical Methods I	7.5	Optional
MATH2012	Stochastic Processes	7.5	Optional
MATH2045	Vector Calculus and Complex Variable	7.5	Optional

Part III

Part III Compulsory

Code	Module Title	ECTS	Type
LANG3005	Year Abroad Research Project YARP	15	Compulsory

Part IV

Part IV Core

Code	Module Title	ECTS	Type
MATH3032	Communicating and Researching Mathematics	7.5	Core
FREN9013	French Language Stage 7	15	Core

Part IV Optional

Code	Module Title	ECTS	Type
MATH3063	Actuarial Mathematics I	7.5	Optional
MATH3033	Graph Theory	7.5	Optional
MATH3052	Mathematical Biology	7.5	Optional
MATH3018	Numerical Methods	7.5	Optional
MATH3016	Optimization	7.5	Optional
MATH3044	Statistical Inference	7.5	Optional
STAT3010	Statistical Methods in Insurance	7.5	Optional

Progression Requirements

The programme will follow the University's regulations for ***Progression, Determination and Classification of Results: Undergraduate and Integrated Masters Programmes*** or the University's regulations for ***Progression, Determination and Classification of Results: Standalone Masters Programmes*** as set out in the General Academic Regulations in the University Calendar: http://www.calendar.soton.ac.uk/sectionIV/sectIV-index.html

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia).
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community, (18.00-08.00)
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

Associated with your programme you will be able to access:

· Module co-ordinators support. Module co-ordinators will be available at designated times during the week to discuss issues related to the particular modules you are studying at the time. This will be in addition to class contact time.

· Academic/personal tutor. As soon as you register on this programme, you will be allocated a personal tutor. S/he is a member of the academic team and will be available to discuss general academic issues related to the programme as well as offer advice and support on any personal issues which may affect your studies.

· Module handbooks/outlines. These will be available at the start of each module (often in online format). The Handbook includes the aims and learning outcomes of the module, the methods of assessment, relevant

background material to the module and a session-by-session breakdown of the module together with appropriate reading lists.

· Within the Faculty, administrative support is provided by your Student Office which deals with student records and related issues and with queries related to your specific degree programme.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

· Completing student surveys for each module of the programme
· Acting as a student representative on various committees, e.g. Staff: Student Liaison Committees, Faculty Programmes Committee OR providing comments to your student representative to feedback on your behalf.
· Serving as a student representative on Faculty Scrutiny Groups for programme validation
· Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group

The ways in which the quality of your programme is checked, both inside and outside the University, are:

· Regular module and programme reports which are monitored by the Faculty
· Programme validation, normally every five years.
· External examiners, who produce an annual report
· A national Research Excellence Framework (our research activity contributes directly to the quality of your learning experience)
· Institutional Review by the Quality Assurance Agency

Further details on the University's quality assurance processes are given in the *Quality Handbook.*

Criteria for admission

The University's Admissions Policy applies equally to all programmes of study. The following are the typical entry criteria to be used for selecting candidates for admission. The University's approved equivalencies for the requirements listed below will also be acceptable.

Alternative qualifications
Cambridge Pre-U
Our normal requirements are for D3D3M1 in the three principle subjects including D3 in Mathematics and French.

In addition we welcome applications from candidates offering other suitable qualifications with an appropriate mathematical content.

Qualification	Grades	Subjects required	Subjects not accepted	EPQ Alternative offer (if applicable)	Contextual Alternative offer (if applicable)
International Baccalaureate	36 points, 18 at higher level	including 6 in higher level mathematics			

A Level	AAA (or AAB with Further Mathematics)	A in A-level Mathematics and grade A in the relevant language			

Recognition of Prior Learning (RPL)

The University has a **Recognition of Prior Learning Policy**

Students are accepted under the University's recognition of prior learning policy; however, each case will be reviewed on an individual basis.

English Language Proficiency

The table below sets out the English proficiency requirements for this programme in terms of the IELTS test. We accept a range of other English proficiency tests including TOEFL and Cambridge Advanced/Proficiency. For full details of the recognised tests and the equivalent requirements in those tests please see *www.southampton.ac.uk/admissions-language*.

Overall	Reading	Writing	Speaking	Listening
6.5	5.5	5.5	5.5	5.5

Career Opportunities

Employability is embedded into modules from the first year onwards and right from the first lecture. We explain the degree skills which are taught throughout the modules and offer a number of optional employability modules.

The technical skills you will acquire are in great demand, as are the skills of understanding and analysing problems, together with communicating the results in an international language.

Our degrees are a passport to vocational and non-vocational careers alike, with recent graduates employed in roles ranging from actuaries and statisticians to crime analysts and medical researchers.

External Examiner(s) for the programme

Name: John Parker - University of Durham

Name: Lawrence Pettit - Queen Mary College University of London

Name: Dolores Romero Morales - Copenhagen Business School

Name: Malcolm Brown - University of Kent

Name: Professor Martyn Cornick - University of Birmingham

Name: Dr Ulrike Bavendiek - University of Liverpool

Name: Dr Deborah Shaw - University of Portsmouth

Name: Peter Duck - University of Manchester

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their Personal Academic Tutor in the first instance.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme also have to pay for:

Additional Costs

Type	Details
Software Licenses	The software required for the programme is available on all public workstations on campus, and accessible from your own computer via VPN.
ML Residence Abroad - Cost implications	As you know, the ML third year includes a period of study or work abroad as a compulsory element of a four year degree, and as a result, all students pay reduced home tuition fees to Southampton their third year (currently 15% for home and EU students, 40% for International Students) irrespective of what placement they take up. However, as happens whilst you are in Southampton, students are expected to pay their own travel expenses, accommodation and other living expenses. So that you can assess the viability of the different options available to you, the following outlines their general cost implications, but please do bear in mind that these may vary enormously from student to student depending on what placement is selected and where it is located. Should you need further information, please contact the relevant RA language coordinator.
Students studying or working in Europe	Students are eligible for a small grant through the British Council, which is means tested against their salary (if relevant) and which varies every year (as a guide, students this year receive around 350-400 Euros per month). The only exceptions to this are students who currently live full- time with their parents and for whom household income is above the threshold. British Council students also receive a monthly salary (this varies country to country) and are expected to pay for their International Child Protection Certificate (ICPC) checks, which are mandatory and currently cost £45. University students tend to receive a slightly higher grant than those who working for the British Council since they are not in receipt of a salary. They pay no tuition fees to their host university. Work placement students may or may not be paid, and their grant is calculated accordingly.
Students studying or working outside Europe	These students are not eligible for the British Councilgrant but may be able to apply for funding to support their travel etc. through the International Office. All students are expected to pay for their own student visas; costs vary from country to country. Students studying in Latin America or China will generally have to pay host university fees, although typically these are no more than £100 for the academic year. Students working in Latin America are not generally paid a stipend. Some receive free accommodation, travel or meals as a work benefit, others (generally in voluntary work) often also have to pay to join the scheme and be eligible to work do not receive this. Students taking place in the Mexico link receive a bursary.
Stationery	You will be expected to provide your own day-to-day stationery items, e.g. pens, pencils, notebooks, etc.). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks	Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some

	modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Placements (including Study Abroad Programmes)	Travel costs: Students on placement programmes can expect to cover costs for health and travel insurance, accommodation and living expenses; travel costs; visa costs. This will vary depending on which country you are travelling to. Specific details on what additional costs there will be are detailed in the individual module profiles which can be found under the modules tab of the programmes details of your programme.
Approved Calculators	Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved models are Casio FX-570 and Casio FX-85GT Plus. These may be purchased from any source and no longer need to carry the University logo.
Printing and Photocopying Costs	In the majority of cases, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy. A list of the University printing costs can be found here: http://www.southampton.ac.uk/isolutions/students/printing-for-students.page For students undertaking modules with a high mathematical content, some assessed work will be submitted in handwritten hard copy format. Students are advised that they will need to bear the costs of the required stationery.

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at www.calendar.soton.ac.uk.