



UNDERGRADUATE PROGRAMME SPECIFICATION

Programme Title:	Mathematics
Awarding Body:	Staffordshire University
Teaching Institution:	Faculty of Computing, Engineering and Technology, Staffordshire University
Final Awards:	BSc(Hons) Mathematics
Intermediate Awards:	CertHE; DipHE; Ordinary
Mode of Study	Full Time
UCAS Codes:	G100
QAA Subject Benchmarks:	Mathematics, Statistics & Operational Research
JACS Code:	Mathematics and Statistics
Professional/Statutory Body:	
Date of Production:	February 2012
Date of Revision:	October 2014

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contact us.**

EDUCATIONAL AIMS OF THE PROGRAMME

The aim of the programme is to provide students with an undergraduate education in the field of mathematics and statistics.

The Mathematics Award aims to provide all graduates with the following attributes:

- A broadly based and well-integrated education in the application of mathematical and statistical tools and techniques to the analysis of a wide range of problems
- An ability to use mathematical, statistical and computer models
- Increased knowledge and well-developed intellectual and imaginative reasoning
- Developed skills in written, verbal, and visual communication
- A commitment to lifelong learning
- Preparation for a successful career in any area requiring the practical application of mathematics and statistics

What is distinctive about this programme?

The need for employees who are able to work with data and numbers is ever increasing in a world of computers that make data and information readily available. In this course we develop the skills that allow for the practical application of mathematics and statistics. The use of computers and packages to support the analytical and modelling aspects throughout the course is considered fundamental to the nature of the award. Students may also undertake an Industrial Placement year, during their third year. This work experience greatly enhances student employability and further reflects the practical and application driven ethos of this award.

The Staffordshire Graduate

The Staffordshire Graduate represents a set of qualities that the University passionately believes is necessary for success in the 21st century. The Staffordshire Graduate is a reflective and critical learner with a global perspective, prepared to contribute in the world of work.

The Mathematics Award embraces the aims of the Staffordshire graduate. The skill set required to meet the demands of the 21st century workplace are delivered and assessed across a range of modules at every level. The vital skills which are developed are presentational and report writing skills; technical skills; career planning and development; entrepreneurial skills and life-long transferable skills. The modules which are key to developing these attributes are: Personal and Academic Development, at Level 4; Professional and Enterprise Development at Level 5 and the project at Level 6.

The Mathematics Award aims to produce graduates with practical as well as analytical skills. Students are expected to be able to analyse, formulate and solve problems and critically reflect on the process. Graduates will be able to use technology to produce solutions and critically evaluate and be aware of the limitations of the solutions produced. The project brings together skills which employers value, including organisation, time management, risk assessment, awareness of ethics and presentational skills (both written and oral).

Graduates will have experienced group work at Levels 4 and 5. Experience of group work is essential, as it enables students to develop intrapersonal skills, which are important in the workplace. Those graduates who have undertaken a placement year, will have had the opportunity of applying their acquired skills in a non-academic environment. These students will have experienced the process of finding a placement, which includes completion of CVs, applications, interviews and the employment selection process. The placement experience therefore greatly enhances student employability and is excellent preparation for the student to enter the workplace.

Graduates on our award will also be encouraged to become life-long learners. Students will have been made aware of their individual learning styles and strengths/weaknesses and been provided with the tools for self-improvement. Students will be expected to reflect on how information gained can be used to their best advantage.

PROGRAMME OUTCOMES

What will this programme teach me to do? At the end of your studies you should be able to:

Knowledge & Understanding Demonstrate knowledge and understanding of a broad range of topics, methods and techniques in the areas of mathematics, statistics and operational research.
Learning Demonstrate an understanding of assumptions and limitations of mathematical and statistical models; understand the development of a general theory and its application to specific instances
Enquiry Identify, research, formulate, and deploy mathematical techniques and statistical analysis to initiate and carry out quantitative investigations including projects and surveys.
Analysis Develop, and critically evaluate logical arguments and assumptions; use appropriate statistical techniques to analyse data; develop mathematical models; and to make judgements.
Problem Solving Develop skills in abstracting the essentials of a problem, formulating them mathematically and obtaining solutions by appropriate methods, both analytical and numerical as necessary.
Communication Present arguments, solutions, conclusions and interpret software output accurately and effectively to both technical and non-technical audiences where appropriate using mathematical notation.
Application Apply a range of mathematical and statistical concepts and methods, showing effective judgement in the selection and application of the tools and techniques, and the use software to develop solutions where appropriate.
Reflection Learn independently; exercise analytical and reasoning skills; critically evaluate solutions; and demonstrate the learning ability, qualities and transferable skills necessary for employment or further study of a professional or equivalent nature

PROGRAMME STRUCTURE, MODULES AND CREDITS

Mathematics Award

L E V E L 4	Teaching Block 1	Personal and Academic Development MATH40298	Introductory Statistics and Probability MATH40398	Mathematical Software MATH40295	Applied Mathematical Methods MATH40294
	Teaching Block 2	Mathematical Principles MATH40309			

To progress to Level 5 at least 90 credits must be passed.

L E V E L 5	Teaching Block 1	Modelling and Planning in Business MATH50299	Survey Design and Statistical Inference MATH50400	Mathematical Modelling and Operational Research Math50300	Option
	Teaching Block 2				Project Proposal and Professional Development COIS51078

To progress to Level 6 at least 210 credits must be passed

Level 5 Options:

Teaching route:

EDUC50528 Teaching Pedagogy and Practice

Technology route:

COIS51058 Database Management and Administration

L E V E L 6	Teaching Block 1	Experimental Design and Statistical Modelling MATH60310	Mathematical Methods and Fluid Mechanics MATH60311	Mathematics and Statistics Project MATH60304	Option
	Teaching Block 2				Simulation Modelling MATH60320

Level 6 Options:

Teaching route:	EDUC60230 Preparation for Teacher Training
Technology route:	MATH60323 Spreadsheet Automation with VBA
Enhancement route:	ELEC60288 Enterprise and Entrepreneurship

Teaching and Technology routes have been introduced (at Levels 5 and 6) to allow students to follow a particular route dependent on their chosen career paths. The modules on each route are independent and so students can switch between the routes, which are not reflected in the Award title.

HOW WILL I BE TAUGHT AND ASSESSED?

Teaching and Learning

The nature of this award dictates that a range of teaching, learning and assessment methods be used consistent with the learning outcomes to be developed and assessed within a specific module. Teaching and learning will include lectures, smaller group tutorials, laboratory sessions, problem based or design tasks, individual and team activities. In many cases learning will be facilitated by use of a virtual learning environment (for example, Blackboard). Transferable skills, such as giving presentations, writing reports, group work and time management are developed throughout the award.

The award has been designed to allow students to follow pathways dependent on their career choice. All of the first year is core and introduces students to a range of techniques and software that are vital for the successful completion of this award. In the second and third years students have the option of either taking Technology based modules (databases and spreadsheets) or Teaching modules to reflect their own career interest.

Modules will typically have lectures followed by tutorials and/or practical sessions. Lectures will be used to deliver the core content of modules. Lecturers will present information and highlight the main concepts and key points, coupled with examples of application. The lecture environment will also enable the student to experience the processes involved in the development and presentation of mathematics.

Tutorials will typically be class room based and give students the opportunity to clarify their understanding of the material presented in lectures. Tutorials will typically involve students attempting structured exercises, allowing them to assess their own understanding of the material presented during lectures. The correct presentation of written Mathematics is encouraged in these sessions. A member of staff will be present during tutorials and will give students feedback and guidance on their progress.

Practicals will typically be held in computer laboratories. Software will be used (typically Excel, SPSS and MAPLE) to develop solutions to problems which are either too time consuming or too complicated to attempt by hand. Additionally, the work place often utilises software for analysis and it is therefore vital that students are both comfortable and capable working with suitable packages. As well as the technical skills acquired, a further critical skill that will be developed during these sessions will be the interpretation of the output produced by the software.

In some modules students will be expected to undertake group work. This provides students with the opportunity to interact with others, organise and manage meetings, understand team roles and work effectively within a team environment.

All modules have an element of student centred learning associated with them. These are hours outside normal class contact time and there is an expectation that students will use these hours to consolidate their understanding of the material presented in lectures; read around subject areas; and work on tutorial and assignment problems.

Throughout your learning you will be exposed to application of the concepts met, this is considered vital to your understanding of the role of mathematics and statistics in the world.

Teaching and learning is also designed to ensure that the qualities of the Staffordshire Graduate are embedded within the award.

Assessment

Assessment will be based around a faculty standard model where modules will, generally, have no more than one piece (or one portfolio) of summative assessment per 15 credits (contributing to the module grade). Modules may also contain formative assessment, designed to provide early feedback and performance indicators to students, without contributing to the module grade.

Full details of assessment types and of learning opportunities are shown within individual module handbooks. The activities determined by module tutors (and described in the module handbook) are designed to ensure that the learning outcomes can be achieved.

The majority of assessments will be time constrained examinations/tests. These may take the form of traditional written examinations but some tests will take place in computer laboratories and involve the use of software, for example Maple to produce solutions to mathematical problems or Excel to develop and enhance previously considered case studies.

Coursework will take a variety of forms including assignments, presentations and report writing. These may be individual or group based. For example, students may be required to undertake a survey on a particular topic and then analyse the data obtained. The results of the investigation need to be presented via a written report and presentation. In group work, students will be expected to demonstrate the ability to work effectively within a team, with the aim of solving one or more of mathematical problems, statistical analysis, or developing analytical models and requires the interaction and communication with others.

Assessment is also designed to ensure that the qualities of the Staffordshire Graduate are met within the award.

ADDITIONAL INFORMATION

Entry Requirements (including IELTS score)

What qualifications would I need to join this programme?

The entry requirements for the award are normally:

All applicants are individually assessed on their qualifications, skills and experience. However, a typical three A level offer will be 280 UCAS tariff points. The Mathematics award assumes A-level Maths entry but applicants with AS level Maths or equivalent as well as those with BTEC qualifications in a quantitative discipline are invited and will be considered on a one by one basis.

All applicants are also required to have a minimum of GCSE English grade C or equivalent.

All overseas applicants are required to have a minimum IELTS score of 6.

Further details may be found at

http://www.staffs.ac.uk/courses_and_study/undergraduate_courses/entry_requirements/

Disability Statement

Staffordshire University operates a policy of inclusive teaching and learning to ensure that all students have an equal opportunity to fulfil their educational potential. Details about how to apply to have your needs assessed can be found at:

<http://www.staffs.ac.uk/study/disabled/>

AWARD SPECIFIC INFORMATION

Compensation Rules

The University rules on compensation apply to this award. The most current regulations can be found at:
<http://www.staffs.ac.uk/legal/policies/awardregs/index.jsp>

Final year project

In order to qualify for the award of an Honours degree the project module must be passed – the project will not be compensated.

Minimum threshold marks.

You are required to gain at least 30% in each component of assessment and get an aggregate mark of over 40% in order to pass the module. Here, the separate components are those listed in the module descriptor. Modules that have been failed due to failure to meet the minimum requirements may still be subject to compensation.

The Industrial Placement Year

All students will have the opportunity to undertake an optional period of industrial work experience. This is usually during the third year. To progress to a placement at least 195 credits must be passed including all required Level 4 credits and at least 75 Level 5 credits.

The Industrial Placement is normally a salaried year, the company employer paying the students for their work. During this period, the experience of work greatly enhances your employability. The process of finding a placement involves you in the completion of CVs, applications, interviews and the whole employment selection process, thus providing excellent experience ahead of the final year

Further information about the award can be found in the relevant Student Handbook and on the University Website. This includes information about optional modules, learning outcomes at levels below honours, student support, and academic regulations.

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THE STAFFORDSHIRE GRADUATE

The Staffordshire Graduate represents a set of qualities that the University passionately believes is necessary for success in the 21st century. The Staffordshire Graduate is a reflective and critical learner with a global perspective, prepared to contribute in the world of work.

The table below indicates where, within your award, these characteristics are addressed:

AWARD TITLE:		Mathematics	
Characteristic	Award Module(s) including level and number of credits	Method of Assessment	
Work-ready and employable	Level 4 - Mathematical Software (30 credits)	Develops skills in analysis, computer literacy, and group working – assessed via group work preparation of spreadsheet model to fit a given case study, spreadsheet model adaptation/enhancement under test conditions and an individual report	
	Level 5 –Project Proposal and Professional Development (15 credits)	Develops knowledge and skills in career planning and development – class based test and portfolio of work	
	Level 6 – Project (30 credits)	Requires students to demonstrate organisation, awareness of ethics, risk assessment, time management, problem formulation, problem solving, structured writing and oral presentation - Individual project plan, log book, project report, and oral presentation	
Understanding of enterprise and entrepreneurship	Level 5 -Project Proposal and Professional Development (15 credits)	Class Test covering professional and ethical issues; communication and teamwork theory; enterprise and entrepreneurship	
	Level 5 - Modelling and Planning in Business (30 credits)	Students will meet financial calculations including net present value, as well as decision making and forecasting	

		techniques – class test
	Level 6 – Project (30 credits)	Requires students to demonstrate organisation, awareness of ethics, risk assessment, time management, problem formulation, problem solving, structured writing and oral presentation - Individual project plan, log book, project report, and oral presentation
Understanding of global issues and their place in the global economy	Level 5 - Modelling and Planning in Business (30 credits)	Virtual share trading assignment requires an appraisal of the global market conditions prevailing throughout the duration of the project and a reflection of how these impacted on the student's trading decisions – assignment
	Level 5 -Project Proposal and Professional Development (15 credits)	Class Test covering professional and ethical issues; communication and teamwork theory; enterprise and entrepreneurship
Communication skills	Level 4 – Personal and Academic Development (15 credits)	Group presentation and Individual report <u>Group work</u> requires students to work with people they do not initially know, understand the team roles and how to deal with conflict within teams , work with their group to effectively perform a presentation. Effective communication skills are developed. The <u>Individual</u> written section of the assessment involves researching, referencing , academic writing and reflection- all essential skills for the Staffordshire graduate.
	Level 5 - Survey Design and Statistical Inference (30 credits)	Students are required to analysing a sample of data and write a report detailing the analysis, results & conclusions,

		communicating them in a way that non-statisticians will understand.
	Level 6 – Project (30 credits)	Requires students to demonstrate skills in structured writing and oral presentation Individual project plan, log book, project report, and oral presentation
Presentation skills	Level 4 – Personal and Academic Development (15 credits)	Group presentation – involves undertaking a formal presentation. Each student to participate and be able to articulately answer questions posed. Assessed on quality of researched information, quality of slides and presentation skills such as audience engagement.
	Level 5 - Mathematical Modelling and Operational Research (30 credits)	Peer-assessed group presentation
	Level 6 – Project (30 credits)	Presentation
The ability to interact confidently with colleagues	Level 4 – Personal and Academic Development (15 credits)	Students are required to work and give presentations in groups. Groups are randomly generated so students will be working with people they do not know, they have to organise meetings, organise content of the presentation and solve problems involved with group working. The life-cycle of the group needs to be understood. Also why Conflict arises and methods to overcome the conflict. Team work is needed to succeed in this assessment.
	Level 5 - Mathematical Modelling and	Develops skills in team working –

	Operational Research (30 credits)	peer-assessed group presentation
	Level 5 -Project Proposal and Professional Development (15 credits)	Group discussions and development to inform coursework; Group presentation
Independence of thought	Level 4 - Personal and Academic Development (15 credits)	Students are required to investigate their individual learning styles/strengths and weaknesses and create an action plan for self-improvement. Students are asked to reflect on their learning styles and how they can use the information gained to their best advantage.
	Level 5 – Survey Design and Statistical Inference (30 credits)	Research is required in order to plan to conduct a survey on a large scale to measure attitude or opinion. The students must make informed decisions as to which sampling strategy is most appropriate and devise a questionnaire that will allow for use of a suitable scaling method.
	Level 6 – Project (30 credits)	Demonstrate planning and investigative skills assessed via project plan; log book; project report and oral presentation
Skills of teamworking	Level 4 - Introductory Statistics and Probability (30 credits)	A group presentation involving the collection, presentation, analysis of data and communication of results in the presentation. Each member of the team making a contribution to the oral presentation. Powerpoint slides produced would be submitted for assessment.
	Level 5 – Mathematical Modelling and Operational Research	Peer-assessed group presentation

	(30 credits)	
	Level 5 -Project Proposal and Professional Development (15 credits)	Group discussions and development to inform coursework; Group presentation
Ability to carry out inquiry-based learning and critical analysis	Level 4 – Introductory Statistics and Probability (30 credits)	This is an individual assignment consisting of several short tasks analysing data based on a quality control scenario. Students will need to determine and generate appropriate control charts, comment on what the charts reveal and give recommendations to a fictitious company in the form of a written report.
	Level 5 – Survey Design and Statistical Inference (30 credits)	Research is required in order to plan to conduct a survey on a large scale to measure attitude or opinion. The students must make informed decisions as to which sampling strategy is most appropriate and devise a questionnaire that will allow for use of a suitable scaling method.
	Level 6 – Project (30 credits)	Requires students to demonstrate problem formulation, problem solving, and critically reflect on the project process - project report and oral presentation
Skills of problem solving and creation of opportunities	Level 4 – Applied Mathematical Methods (30 credits)	Develops skills in a range of concepts; use of software for problem solving – individual assignment work and traditional test/examination
	Level 5 – Mathematical Modelling and Operational Research (30 credits)	Develop generic skills in data gathering, model formulation – group & individual report; application and analysis using OR models under test conditions
	Level 6 – Project	Requires students to demonstrate problem

	(30 credits)	formulation and problem solving- project report and oral presentation
Technologically, digitally and information literate	Level 4 - Mathematical Software (30 credits)	Preparation of a spreadsheet model to fit a given case study, adaptation/enhancement under test conditions
	Level 5 - Mathematical Modelling and Operational Research (30 credits)	Develops generic skills in data gathering, model formulation and use of software for problem solving. Group and individual reports, oral presentation
	Level 6 - Differential Equations and Fluid Mechanics (30 credits)	Use of software to develop skills in a range of advanced concepts in a specialised area Individual assignment work as well as traditional test/exam
Able to apply Staffordshire Graduate attributes to a range of life experiences to facilitate life-long learning	Level 4 - Personal and Academic Development (15 credits)	The students is required to write a report which documents the different tests or exercises available to assess their individual skills and learning type, including skills mapping, skills audits, learning styles and goal setting. The students use the information gathered about their skills to produce development plans . The content of this module is about self assessment, working with others, and continuous individual development.
	Level 5 –Project Proposal and Professional Development (15 credits)	Discusses career planning and development, professional issues and reflects on personal development – portfolio of work and class based tests.
	Level 6 – Project (30 credits)	Encourages life-long transferable skills in organisation, awareness of ethics, risk assessment, time management, problem formulation, and problem solving - Individual project plan, log book, project

		report, and oral presentation
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Notes:

Award Modules

Indicate which module(s) within the award develop this characteristic

Assessment

Indicate how achievement of the characteristic is assessed

ADDENDUM FOR DELIVERY AT A PARTNER INSTITUTION

This section should record any matters within the programme specification which do not apply to the delivery at the partner. It should also note any differences in delivery, course content, module choice etc.

Name and location of partner	
Partnership Context	E.G., The awards listed below are part of a franchise arrangement with Staffordshire University.
Awards to be offered at partner	
Aims / Learning Outcomes	
Curricula	
Teaching and Learning	
Assessment	
Admissions Criteria	
Specific Regulations	
Date of completion	

All of the above sections should be completed as appropriate for each partner organisation.

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