

## University of the West of Scotland Undergraduate Programme Specification

Session: 2023/24

Last modified: 28/04/2023 16:17:39

Status: Pending

<b>Named Award Title:</b>	<b>BSc (Hons) Mathematics with Education 2023 Single</b>
<b>Award Title for Each Award:</b>	<b>BSc (Hons) Mathematics with Education 2023 BSc Mathematics with Education Studies Dip HE Mathematics Cert HE Mathematics</b>
<b>Date of Validation:</b>	June 2023
<b>Details of Cohorts Applies to:</b>	Any new students entering at L7 or L8 in Session 2023/24 and any L7 students from Session 2022/23 continuing to L8 in Session 2023/24
<b>Awarding Institution/Body:</b>	University of the West of Scotland
<b>Teaching Institution:</b>	University of the West of Scotland
<b>Language of Instruction &amp; Examination:</b>	English
<b>Award Accredited By:</b>	General Teaching Council for Scotland (GTCS)
<b>Maximum Period of Registration:</b>	8 years
<b>Mode of Study:</b>	Full Time
<b>Campus:</b>	Ayr Paisley
<b>School:</b>	School of Computing, Engineering and Physical Sciences
<b>Programme Board</b>	Physical Sciences
<b>Programme Leader:</b>	Alan J. Walker

### **Admission Criteria**

Candidates must be able to satisfy the general admission requirements of the University of the West of Scotland as specified in Chapter 2 of the University Regulatory Framework together with the following programme requirements:

#### **SQA National Qualifications**

Year 1: HIGHERS: BBBC including Mathematics and one other Science subject from Biology, Human Biology, Chemistry, Computing Science, Geography, Psychology or Physics plus English at SCQF Level 5 (e.g. National 5, Standard Grade (Grade 3 or above), Intermediate 2).

Year 2: ADVANCED HIGHERS: CCD including Mathematics plus English at SCQF Level 5 (e.g. National 5, Standard Grade (Grade 3 or above), Intermediate 2).

Before progressing to Year 3, students must have attained a qualification in English at SCQF Level 6 (e.g. Higher). Furthermore, students must successfully undertake an interview conducted by School of

Education staff.

Students who are offered the opportunity to progress to Year 3 of this programme must apply for and obtain membership of the Protection of Vulnerable Groups Scheme before enrolment.

Experience of working with young people and up-to-date knowledge and understanding of secondary education in Scotland will aid progression to Year 3.

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**or GCE**

Year 1: A-LEVEL: CCD including Mathematics plus GCSE (Grade C or above) in English and one other Science subject from Biology, Human Biology, Chemistry, Computer Science, Geography, Psychology or Physics.

Year 2: A-LEVEL: BCC including Mathematics plus GCSE (Grade C or above) English.

Before progressing to Year 3, students must meet the following requirements: GCSE English Language and English Literature at C or above. Furthermore, students must successfully undertake an interview conducted by School of Education staff.

Students who are offered the opportunity to progress to Year 3 of this programme must apply for and obtain membership of the Protection of Vulnerable Groups Scheme before enrolment.

Experience of working with young people and up-to-date knowledge and understanding of secondary education in Scotland will aid progression to Year 3.

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**or SQA National Qualifications/Edexcel Foundation**

Year 1: relevant HNC, which includes Higher National Unit: Engineering Mathematics 1 (H7K0 33).

Year 2: relevant HND, which includes Higher National Units: Engineering Mathematics 2 (H7K1 34) and Engineering Mathematics 3 (H7K2 34).

Before progressing to Year 3, students must have attained a qualification in English at SCQF Level 6 (e.g. Higher). Furthermore, students must successfully undertake an interview conducted by School of Education staff.

Students who are offered the opportunity to progress to Year 3 of this programme must apply for and obtain membership of the Protection of Vulnerable Groups Scheme before enrolment.

Experience of working with young people and up-to-date knowledge and understanding of secondary education in Scotland will aid progression to Year 3.

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**Other Required Qualifications/Experience**

Year 1: Irish Leaving Certificate: BBBC2 including Mathematics and one other science subject\* or International Baccalaureate (IB) Diploma: 24 points (including Mathematics and one other science\* plus two other subjects at Higher level).

Year 2: BTEC Extended Diploma: DDM, Scottish Baccalaureate in Science: Advanced entry to Year 2 will be dependent on subjects studied and grade of award or International Baccalaureate (IB) Diploma: 28 points including Mathematics and one other science subject\*, four subjects to be at Higher level.

\*Science subjects: Biology, Human Biology, Chemistry, Computing/Computer Science, Geography, Physics, Psychology.

Before progressing to Year 3, students must successfully undertake an interview conducted by School of Education staff.

Students who are offered the opportunity to progress to Year 3 of this programme must apply for and obtain membership of the Protection of Vulnerable Groups Scheme before enrolment.

Experience of working with young people and up-to-date knowledge and understanding of secondary education in Scotland will aid progression to Year 3.

### **Further desirable skills pre-application**

#### **General Overview**

The BSc (Hons) Mathematics with Education programme is designed to enable students to complete in four years Honours degree level study in Mathematics with the teaching qualification required to teach Mathematics in secondary schools.

The programme is designed to fulfil the requirements of the QAA subject benchmark statement for Mathematics, Statistics and Operational Research (MSOR) (2015), the Guidelines for Initial Teacher Education Programmes in Scotland (GTCS, 2013), the benchmark statement for Standard for Provisional Registration (GTCS, 2012) and the QAA subject benchmark statement for Education Studies (2015).

The overall aim of the programme is to develop individuals with a range of transferable graduate skills who will acquire Honours-level knowledge and skills in Mathematics and Statistics alongside attaining the Standard for Provisional Registration. Consequently, such individuals will be eligible to apply for provisional registration with GTCS, and entry to the Teacher Induction Scheme as secondary school teachers of Mathematics. These teachers of Mathematics would also be fully equipped to deliver material in Statistics at secondary school level.

The programme teaches the fundamentals of Mathematics and Statistics as a core science and computer laboratory sessions develop practical and communication skills. Across the four years of the programme, increasingly complex understanding of Mathematics and Statistics, viz. Algebra, Calculus, Probability & Statistics, is developed. Depth of knowledge across a broad range of topics supports the teaching of senior phase courses up to, and including, Advanced Higher level.

The BSc (Hons) Mathematics with Education programme is identical to the BSc (Hons) Mathematics programme until the third year of the degree. This allows flexibility for students who may decide during the course of their studies that they wish to transition towards, or away from, the education component, provided that the extra entry requirements for the Mathematics with Education programme are met.

The study of Education is introduced in year three with a focus on key educational issues, cross-cutting curricular themes, contexts for learning and professional values. Knowledge and understanding of curriculum, pedagogy and assessment of secondary Mathematics, and the skills and abilities to implement effective teaching and learning, are developed in year four, through campus teaching and school experience placements.

In accordance with the relevant benchmarks, graduates will have demonstrated the attributes, knowledge and skills encompassed by the following core areas:

#### Professional Values and Personal Commitment

The core values defined as Social Justice, Integrity, Trust and Respect, and Personal Commitment, which are integral to, and demonstrated through, all professional relationships and practices.

#### Professional Knowledge and Understanding

The knowledge and understanding of Mathematics within the secondary curriculum, including contexts for learning to fulfil their responsibilities in literacy, numeracy, health and wellbeing and interdisciplinary learning; the principal features of the education system and their own professional responsibilities within the learning communities in which they will teach; relevant educational principles and pedagogical theories; and the importance of research in informing professional practice.

#### Professional Skills and Abilities

The ability to design, deliver and assess effective, appropriate and stimulating programmes of work in Mathematics within the secondary curriculum that are suitable for children at different stages of secondary education; and to use reading, research and feedback from a range of sources to inform effective self-evaluation and maintain a record of professional learning and development culminating in an Initial Professional Development Action Plan.

The programme will encourage the student to engage in lifelong learning, study and enquiry and to appreciate the value of education to society. It will also assist the student to develop the skills required for both autonomous practice and team-working.

#### **Opportunities for further study**

The Standard for Provisional Registration is part of a suite of professional standards published by GTCS (2012). Individuals obtaining Provisional Registration aim to progress to Full Registration and are then expected to continue to develop their expertise through appropriate and sustained career long professional learning (GTCS, 2012). The suite of professional standards may be used to guide this

learning and includes, for example, the Standards for Leadership and Management. Non-award-bearing courses have always formed an important part of professional development and update for teachers, but many opportunities exist at Masters level and above in subjects and areas relevant to schools and the wider world of education.

Honours graduates may choose to pursue further study of Mathematics and/or Statistics through Masters or Doctoral programmes at this or other universities.

### **Teaching, learning and assessment**

Formal lectures will be supported by a range of blended learning activities such as small group tutorials, workshops, computer laboratory classes and use of the University VLE. These activities will employ a range of learning and teaching methodologies including group work, investigations, problem-based learning, concept visualisation (e.g. using drawing and collage), walking, student presentations and online tutor/student-led discussions. Resources such as industry-standard mathematical, computational and statistical software packages (e.g. Maxima, Python, SPSS and R), interactive whiteboards, laptops and the outdoors, will be used, as appropriate, to develop student learning.

In order to enable students undertaking BSc (Hons) Mathematics with Education, BSc (Hons) Chemistry with Education, BSc (Hons) Physics with Education, PGDE (Secondary) and PGDE (Primary) programmes to benefit from working together, the School & Professional Studies (L9) module will be delivered through a blended approach using the University VLE and some face-to-face lectures, tutorials and workshops.

Within the University VLE, students will experience a range of e-learning methods. They will be required to remotely access set and extension readings and other course materials, and communicate both online and asynchronously with peers, whilst being supported by tutors, to address problem-based learning tasks. Students are required to undertake significant independent learning in each module. Student handbooks and other material made available to students will give more detailed information on the particular learning and teaching methodologies, and combinations of these methodologies, to be used for timetabled student sessions. This will clarify for students both their expectations for timetabled sessions, and their expectations for the overall balance of learning and teaching methodologies to be used during the programme.

Ongoing formative assessment across the programme will provide feedback to students on their developing thinking on subject knowledge and skills, educational issues and professional abilities. Summative assessment of academic study will take the form of class tests, written and numerical assignments, essays, project reports, oral presentations, problem sheets and examinations. Assessment of school experience is outlined under Work Based Learning/Placement Details.

## **Graduate Attributes, Employability & Personal Development Planning**

The programme is designed to develop students' range of skills and UWS Graduate Attributes that are transferable to other areas of study and professional employment, i.e.

- developing in-depth knowledge of Mathematics and Education, considering the provenance of such knowledge, and its boundaries and limits, and developing related practical skills;
- being aware of the currency of subject knowledge and having a sound grasp of how new understanding is generated in the subject areas of Mathematics and Education;
- developing critical and higher order thinking skills, including analysis and application, judgement, synthesis and creativity;
- learning experimental and empirical investigation skills relating to the study of Mathematics and the teaching of Mathematics in schools;
- solving problems in Mathematics and Education contexts through application of systematic and critical assessment of complex issues;
- communicating knowledge, understanding and skills effectively, both orally and in writing, in a range of settings;
- developing digital literacy, which includes finding, using and presenting a variety of media and sources of information;
- formulating, evaluating and applying evidence-based solutions and arguments in academic and professional contexts;
- evaluating, reflecting on and acting to improve the effectiveness of their own practice;

- developing skills in working with others, including planning and organisation, questioning and listening, decision making, leadership, and professionalism, through group working, and by doing so developing understanding of others, empathy and compassion;
- nurturing a reflective awareness of ethical dimensions, and responsibilities to others, in academic, educational and everyday contexts;
- developing cultural awareness within a globalised society;
- developing personal competencies, including intellectual ability, personal and intellectual autonomy, knowledge of how to learn, attention to detail and accuracy, numeracy, integrity, character and personality, independence, self-management, initiative, confidence, positivity, enterprise, adaptability and flexibility, and resilience;
- equipping students with the ability and interest to continue to enlarge their knowledge, understanding and skills throughout their working lives.

Upon graduation and provisional registration with the GTCS, graduates are eligible for entry to the Teacher Induction Scheme. This scheme is administered by the GTCS, in partnership with the Scottish Learning Directorate, and provides a guaranteed one-year probationary post to every eligible student.

### **Work Based Learning/Placement Details**

In compliance with the requirements of the GTCS, a total of eighteen weeks, or ninety days, is devoted to school experience, occurring in each school term, with a block of at least four weeks taking place towards the end of the programme, in secondary school environments.

At the end of Level 9 and early in Level 10, students will undertake two-week observation placements in order to establish links between theory and practice. Student handbooks and other very detailed materials made available to students will set out the requirements and expectations of the three substantial periods of school experience, including the maintenance of the teaching file. During each placement, students will monitor their progress through target-setting and evaluation in a personal development plan.

Following formative assessment of the first substantial period of school experience, the two subsequent placements will be assessed summatively by the partner school and the visiting University tutor.

In addition to written feedback, students will receive “Satisfactory” or “Unsatisfactory” grades for each of the eight benchmark areas of the Standard for Provisional Registration. Assessment of the module is on a Pass/Fail basis, dependent upon satisfactory or unsatisfactory performance in school. The overall assessment of Pass or Fail is achieved by totalling the grades awarded by the partner school and those awarded by the University tutor.

In accordance with both module and programme handbooks, any student whose attendance has fallen below the 75% minimum requirement for Secondary STEM Subject Studies and Secondary School Experience, during any of the three blocks of campus study preceding the periods of school experience, is therefore deemed to be unprepared for a period of school experience. Such students will normally be required to undertake a period of further on-campus preparation when other students are on placement. This process assures placement partners that students are appropriately prepared to undertake periods of school experience.

UWS Regulation 1.64 also applies to periods of school experience, and it should be noted that any student whose attendance has fallen below the 75% minimum requirement may be deemed not to have met the professional requirements of the programme as accredited by the GTCS and, therefore, may not be eligible for assessment on that placement. In either case, the required school experience placement would normally be completed in the August/September diet following that academic year of study.

### **Engagement**

In line with the [Academic Engagement Procedure](#), Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time.

Where a programme has Professional, Statutory or Regulatory Body requirements these will be listed here:

In accordance with both module and programme handbooks, any student whose attendance has fallen below the 75% minimum requirement for Secondary STEM Subject Studies and Secondary School Experience, during any of the three blocks of campus study preceding the periods of school experience, is therefore deemed to be unprepared for a period of school experience.

UWS Regulation 1.64 also applies to periods of school experience, and it should be noted that any student whose attendance has fallen below the 75% minimum requirement may be deemed not to have met the professional requirements of the programme as accredited by the GTCS and, therefore, may not be eligible for assessment on that placement.

### **Equality and Diversity**

Further information on the institutional approach to Equality, Diversity and Inclusion can be accessed at the following link: <https://www.uws.ac.uk/about-uws/uws-commitments/equality-diversity-inclusion/>

## **Programme structures and requirements, SCQF level, term, module name and code, credits and awards ( [Chapter 1, Regulatory Framework](#) )**

### **A. Learning Outcomes (Maximum of 5 per heading)**

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

<b>Knowledge and Understanding</b>	
<b>A1</b>	Demonstrate a broad knowledge of fundamentals of algebra, calculus, and statistics
<b>A2</b>	Relate knowledge to mathematical and statistical theories, concepts and principles
<b>Practice - Applied Knowledge and Understanding</b>	
<b>B1</b>	Apply basic knowledge and skills in solving routine problems in mathematics and statistics
<b>B2</b>	Apply basic knowledge and skills in solving investigation-type problems in mathematics and statistics
<b>Communication, ICT and Numeracy Skills</b>	
<b>C1</b>	Use software to tackle a range of numerical and non-numerical problems in theoretical and applicable situations
<b>C2</b>	Present information in a variety of forms relevant to the context
<b>C3</b>	Obtain information and data from standard sources
<b>Generic Cognitive Skills - Problem Solving, Analysis, Evaluation</b>	
<b>D1</b>	Present and evaluate information and ideas in mathematical and statistical problems
<b>D2</b>	Use a range of approaches to the solution of routine problems
<b>Autonomy, Accountability and Working With Others</b>	
<b>E1</b>	Exercise some initiative in and take responsibility for defined activities
<b>E2</b>	Work with others in defined group exercises

### **Core Modules**

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
7	APPD07001	ASPIRE	20	✓	✓		
7	MATH07001	Analysis of Data	20	✓	✓		
7	MATH07003	Calculus A	20	✓			
7	MATH07002	Discrete Mathematics 1	20	✓			
7	MATH07008	Computational Methods	20		✓		
7	MATH07009	Calculus B	20		✓		

\* Indicates that module descriptor is not published.

Footnotes

#### Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	

\* Indicates that module descriptor is not published.

Footnotes

#### Criteria for Progression and Award

Progression to SCQF Level 8 is available to students who fulfil the university progression requirements and obtain at least a Grade C in each core module.

A student may exit with an award of Cert HE in Mathematics, with a minimum of 120 credit points.

#### B. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

<b>Knowledge and Understanding</b>	
<b>A1</b>	Demonstrate a broad knowledge of main areas of mathematics and statistics
<b>A2</b>	Display an understanding of some major core theories and principles of mathematics and statistics
<b>A3</b>	Demonstrate specialist knowledge and understanding of some important mathematical and statistical concepts that underpin issues in classical and contemporary problems
<b>Practice - Applied Knowledge and Understanding</b>	
<b>B1</b>	Use a range of routine skills, techniques and practices in mathematics and statistics, including some advanced aspects

<b>B2</b>	Carry out routine investigations into practical and theoretical issues
<b>B3</b>	Present information gained through non-routine investigations which demonstrates knowledge and understanding of some classical and contemporary mathematical and statistical problems
<b>Communication, ICT and Numeracy Skills</b>	
<b>C1</b>	Use a range of specialist statistical software packages to process and analyse data and perform statistical predictions based on analysis
<b>C2</b>	Use mathematical software to extend the analysis of non-routine problems to those requiring numerical methods
<b>C3</b>	Present information in numerical, graphical, verbal and written forms to a variety of audiences
<b>Generic Cognitive Skills - Problem Solving, Analysis, Evaluation</b>	
<b>D1</b>	Undertake critical analysis, evaluation and synthesis of information related to the main ideas and concepts within the understanding and practice of mathematics and statistics
<b>D2</b>	Use a variety of approaches to develop solutions to defined problems in classical and contemporary problems in mathematics and statistics
<b>D3</b>	Display a critical evaluation of solutions and explanations of output from a range of analytical and numerical techniques
<b>Autonomy, Accountability and Working With Others</b>	
<b>E1</b>	Exercise autonomy and initiative in defined academic and professional activities
<b>E2</b>	Take responsibility for work planning and time management within specified contexts
<b>E3</b>	Co-operate in group working exercises
<b>E4</b>	Work under guidance on a range of current professional practice and issues

#### Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
8	APPD08001	ASPIRE 2 *	20	✓	✓		
8	MATH08008	Multivariable Calculus	20	✓	✓		
8	MATH08007	Linear Algebra	20	✓			
8	MATH08010	Probability and Statistics	20	✓			
8	MATH08002	Differential Equations 1	20		✓		
8	MATH08006	Discrete Mathematics 2	20		✓		

\* Indicates that module descriptor is not published.



## Footnotes

### Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	

\* Indicates that module descriptor is not published.

## Footnotes

### Criteria for Progression and Award

Progression to SCQF Level 9 is available to students who fulfil the university progression requirements and the GTCS requirements for entry to programmes of initial teacher education, i.e. SCQF Level 6 English and SCQF Level 5 Mathematics. Progression is also dependent on a successful interview with School of Education staff.

A student may exit with an award of Dip HE in Mathematics, with a minimum of 240 credit points.

A student failing to meet the GTCS entry requirements or being unsuccessful at interview may transfer to the BSc (Hons) Science degree.

From Academic Year 2023/24, a student failing to meet the GTCS entry requirements or being unsuccessful at interview may transfer to the BSc (Hons) Mathematics degree.”

### C. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

<b>Knowledge and Understanding</b>	
<b>A1</b>	Demonstrate a broad and integrated knowledge and understanding of major aspects of mathematics and statistics and current educational issues
<b>A2</b>	Display a critical understanding of principal theories, principles, concepts and terminologies of mathematics, statistics and education, including curriculum design, contexts for learning and cross-curricular links
<b>A3</b>	Show a knowledge of specialisms in calculus, differential equations, complex analysis, plus two other chosen specialist areas in pure and applied mathematics or statistics
<b>A4</b>	Demonstrate knowledge of current educational issues and effective approaches to teaching and learning informed by forefront developments
<b>A5</b>	Demonstrate knowledge of how to access and apply relevant findings from educational research
<b>Practice - Applied Knowledge and Understanding</b>	
<b>B1</b>	Use a selection of skills, techniques and practices in the analysis of problems in mathematics and statistics

<b>B2</b>	Display skills in techniques, practices and information at a specialised level in mathematics and statistics
<b>B3</b>	Practise routine and more unpredictable investigations and enquiries in mathematics and statistics
<b>B4</b>	Consider how to use skills, practices and materials which are specialised or advanced in a variety of educational settings, environments and circumstances
<b>B5</b>	Consider how to practise in a range of professional contexts, which include a degree of unpredictability
<b>Communication, ICT and Numeracy Skills</b>	
<b>C1</b>	Use statistical software to analyse data at a specialised level and make, and communicate, effective conclusions and recommendations
<b>C2</b>	Use software to analyse increasingly specialist problems in applied mathematics, making and communicating conclusions effectively
<b>C3</b>	Communicate effectively, using a variety of media including digital technologies, and engage in professional dialogue with peers and university staff
<b>C4</b>	Communicate and report effectively, both orally and in writing
<b>C5</b>	Constructing coherent arguments about educational matters and professional practices
<b>Generic Cognitive Skills - Problem Solving, Analysis, Evaluation</b>	
<b>D1</b>	Undertake critical analysis, evaluation and synthesis of ideas, concepts, information and issues in mathematics and statistics, and in educational contexts
<b>D2</b>	Identify and analyse routine professional problems and issues in mathematics and statistics, and in educational contexts
<b>D3</b>	Draw on a range of sources in making judgments on matters relating to mathematics and statistics, and in educational issues
<b>Autonomy, Accountability and Working With Others</b>	
<b>E1</b>	Exercise autonomy and initiative in dealing with activities at a professional level in mathematics and statistics, and in educational contexts
<b>E2</b>	Take some responsibility for the work of others and for the use of resources
<b>E3</b>	Practise working in group exercises taking account of others' roles and responsibilities
<b>E4</b>	Develop awareness of own and others' roles and responsibilities in educational contexts
<b>E5</b>	Work under guidance with specialist practitioners on aspects of professional skills and ethical codes

#### Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
9	EDUC09048	School & Professional Studies (L9)	40	✓	✓		

9	MATH09002	Differential Equations 2	20	✓	✓		
9	MATH09009	Complex Analysis	20	✓			

\* Indicates that module descriptor is not published.

Footnotes

#### Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
9	MATH09013	Abstract Algebra	20	✓			
8	PHYS08007	Classical Mechanics	20	✓			Suitable for level 9 Maths
9		Numerical Analysis 1 *	20		✓		
9	MATH09012	Statistical Estimation and Inference	20		✓		

\* Indicates that module descriptor is not published.

Footnotes

Students can choose to take either abstract algebra or classical mechanics in term 1 or neither, provided that they take both options provided in term 2. If one option is taken in term 1, then one must be taken in term 2.

#### Criteria for Progression and Award

Progression to SCQF Level 10 is available to students who fulfil the university progression requirements.

A student may exit with a BSc Mathematics with Education Studies, with a minimum of 360 credit points. The Progression and Awards Board will award distinction to candidates for undergraduate awards other than Honours degrees where a mean mark of 70% or above is achieved by candidates at their first attempt.

#### D. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

<b>Knowledge and Understanding</b>	
<b>A1</b>	Demonstrate integrated knowledge and critical understanding of a broad range of facts, concepts, principles and theories relating to main branches of mathematics and statistics, and to secondary education
<b>A2</b>	Demonstrate detailed knowledge and understanding of a subject area within the secondary curriculum, current educational issues and effective approaches to teaching and learning, including the ways in which they are developed using established techniques of professional enquiry
<b>A3</b>	Show knowledge of specialist topics in major areas of mathematics and statistics, and awareness of significant issues at the frontiers of the application of statistics in today's society
<b>A4</b>	Demonstrate understanding of classical mathematics topics in the field of partial differential equations and their applications in today's world

<b>A5</b>	Demonstrate knowledge of how to access and apply relevant findings from mathematics and statistics, and educational research
<b>Practice - Applied Knowledge and Understanding</b>	
<b>B1</b>	Exhibit practical skills in classical and contemporary applications of mathematics and statistics, particularly in real-life situations
<b>B2</b>	Design, deliver and assess effective, appropriate and stimulating programmes of work, in a subject area within the secondary curriculum, which are suitable for children at different stages of secondary education, using the results of assessment to evaluate and improve teaching
<b>B3</b>	Use skills, practices and materials which are specialised, advanced or at the forefront of classroom practice in a variety of settings, environments and circumstances, which include a degree of unpredictability and specialism, and maintain a safe, caring and purposeful learning environment within these contexts
<b>B4</b>	Execute a defined project of professional enquiry related to teaching and learning in secondary school of challenging concepts in mathematics or statistics
<b>Communication, ICT and Numeracy Skills</b>	
<b>C1</b>	Communicate effectively, using a variety of media including digital technologies, to promote and develop positive relationships, and to stimulate pupils and achieve the objectives of lessons
<b>C2</b>	Communicate effectively and engage in professional dialogue with peers, university staff and school colleagues
<b>C3</b>	Implement specialist mathematical / statistical software for the analysis of complex data associated with problems in today's society
<b>C4</b>	Communicate and report effectively, both orally and in writing, to a wide range of audiences, including learners, educational practitioners, and the wider community
<b>C5</b>	Construct and sustain reasoned and coherent arguments about educational matters and professional practices
<b>Generic Cognitive Skills - Problem Solving, Analysis, Evaluation</b>	
<b>D1</b>	Undertake critical analysis, evaluation and synthesis of ideas, concepts, information and issues in mathematics, statistics, and educational contexts
<b>D2</b>	Justify a personal stance on educational issues in mathematics and/or statistics by referring to appropriate evidence from a range of sources
<b>D3</b>	Reflect on and act to improve the effectiveness of their own practice and contribute to the processes of curriculum development, school development planning and meeting the educational needs of school communities
<b>D4</b>	Adopt an enquiring approach to professional practice, demonstrating some originality and creativity in finding solutions to professional issues
<b>D5</b>	Develop record of personal professional learning and development into an Initial Professional Development Action Plan
<b>Autonomy, Accountability and Working With Others</b>	
<b>E1</b>	Exercise autonomy and initiative in academic and professional activities, including managing time and prioritising workloads

<b>E2</b>	Work effectively under guidance in a peer relationship with qualified practitioners and other agencies and individuals
<b>E3</b>	Work effectively with others and, at times, take a leading role in bringing about change, development and new thinking relating to an aspect of mathematics, statistics, or secondary education
<b>E4</b>	Deal with complex ethical and professional issues in accordance with current professional and/or ethical codes of practice and in accordance with the needs of schools and wider communities
<b>E5</b>	Demonstrate achievement of all aspects of the Standard for Provisional Registration

#### Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
10	EDUC10049	Secondary School Experience	40	✓	✓		
10	EDUC10050	Secondary STEM Subject Studies	40	✓	✓		
10	MATH10003	Partial Differential Equations	20	✓			

\* Indicates that module descriptor is not published.

#### Footnotes

#### Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
10	MATH10009	Number Theory and its Applications	20		✓		
10	MATH10008	Regression Methods and Experimental Design	20		✓		
10	EDUC10051	STEM Work Based Learning	40	✓	✓		

\* Indicates that module descriptor is not published.

#### Footnotes

Students who do not pass Secondary School Experience (EDUC10049) on the second attempt may undertake STEM Work Based Learning (EDUC10051), which offers an alternative form of assessment of school experience but will not enable provisional registration with the GTCS.

#### Criteria for Award

Honours degrees are classified in accordance with university regulations.

Students who complete a minimum of 480 credit points, including Secondary School Experience, will exit with BSc (Hons) Mathematics with Education, enabling provisional registration with the GTCS.

Students who complete a minimum of 480 credit points, including STEM Work Based Learning, will exit with BSc (Hons) Mathematics with Education Studies, which will not enable provisional registration with the GTCS.

The BSc (Hons) Mathematics with Education programme is an example of a professional programme where a Progression and Awards Board has the power to terminate the programme progress of a student whose continuation on placement is judged to be unacceptably damaging to the interests of placement partners, i.e. schools and their pupils, during school experience. Student handbooks will provide further details. In such cases, students may exit with a Dip HE in Mathematics.

<p><b>Regulations of Assessment</b></p> <p>Candidates will be bound by the general assessment regulations of the University as specified in the <a href="#">University Regulatory Framework</a>.</p> <p>An overview of the assessment details is provided in the Student Handbook and the assessment criteria for each module is provided in the module descriptor which forms part of the module pack issued to students. For further details on assessment please refer to Chapter 3 of the Regulatory Framework.</p> <p>To qualify for an award of the University, students must complete all the programme requirements and must meet the credit minima detailed in Chapter 1 of the Regulatory Framework.</p>
<p><b>Combined Studies</b></p> <p>There may be instances where a student has been unsuccessful in meeting the award criteria for the named award and for other more generic named awards existing within the School. Provided that they have met the credit requirements in line with the SCQF credit minima (please see Regulation 1.21), they will be eligible for an exit award of CertHE / DipHE or BA / BSc in Combined Studies.</p> <p>For students studying BA, BAcc, or BD awards the award will be BA Combined Studies.</p> <p>For students studying BEng or BSc awards, the award will be BSc Combined Studies.</p>

## Changes

### Changes made to the programme since it was last published:

#### General Details

Award Criteria changed from Cert HE Science to Cert HE Mathematics

Award Criteria changed from Dip HE Science to Dip HE Mathematics

#### Level 7 Modules

The core module APPD07001 ASPIRE has been added in place of an optional module at L7.

All optional modules removed from provision.

Information on option modules removed.

Mathematics of Space and Change 1 and 2 renamed to Calculus A and B

Sequences and Patterns renamed to Discrete Mathematics 1

IT Skills and Mathematical Software renamed to Computational Methods

Dealing with data renamed to Analysis of Data and made long-and-thin to balance ASPIRE.

#### Level 8 Modules

The core module APPD08001 ASPIRE 2 has been added in place of an optional module at L8.

All optional modules removed from provision.

Discrete Mathematics renamed to Discrete Mathematics 2 because of renamed

Discrete Mathematics 1 (formerly Sequences and Patterns) at level 7.  
Differential Equations renamed to Differential Equations 2 because of newly renamed Differential Equations 2 (formerly Advanced Calculus) at level 9.  
Multivariable Calculus made long-and-thin to balance ASPIRE 2.  
Numerical Analysis removed as an option at this level.

#### Level 9 Modules

Seeking exemption to ASPIRE 3 because Schools & Professional Studies is 40 credits and we require more than 60 credits of Mathematics provision.  
Advanced Calculus renamed to Differential Equations 2 and made long-and-thin.  
Complex Analysis made core in T1.  
Mechanics removed in T2 and replaced with level 8 PHYS coded module Classical Mechanics as an option in T1.  
Numerical Analysis 1 (formerly level 8 Numerical Analysis) has been moved up to level 9 and is a T2 option.  
Statistical Estimation and Inference is no longer core and is instead an option in T2.

#### Level 10 Modules

The only options are in T2 and are Number Theory and its Applications (formerly Coding & Cryptography) and Regression Methods and Experimental Design.  
**Version Number: 1**