

Programme Specification: Undergraduate

For students starting in Academic Year 2022/2023

1. Course Summary

Name of programme & award title with UCAS code	Mathematics (with integrated year in industry) [G10N]
Awarding Institution	Aberystwyth University
Individual Accreditation(s)	This programme will meet the educational requirements of the Chartered Mathematician designation, awarded by the Institute of Mathematics and its Applications, when it is followed by subsequent training and experience in employment to obtain equivalent competences to those specified by the Quality Assurance Agency (QAA) for taught masters degrees.
Final Award	Bachelor of Science
Date of Publication	September 2023
QAA Subject Benchmark	Information provided by Department of Mathematics Details of the QAA Benchmark statement for Mathematics, Statistics and Operational Research can be found here

How this information might change: Please read the important information at <https://www.aber.ac.uk/en/study-with-us/ug-studies/terms-conditions/>. This explains how and why we may need to make changes to the information provided in this document and to help you understand how we will communicate with you if this happens.

2: Duration

Programme	Years
Mathematics (with integrated year in industry) [G10N]	4

3: Educational aims of the programme

Information provided by Department of Mathematics

- To provide students with knowledge and understanding in a range of topics in Mathematics, including topics in Statistics.
- To develop skills in the application of such knowledge and understanding to the solutions of problems in Mathematics.
- To develop the ability to transfer subject-specific skills to a range of topics in Mathematics.
- To prepare students for careers in Mathematics and Statistics and in allied professions.
- To develop analytical reasoning skills, team-working skills, information technology skills and other skills appropriate to a wide range of careers.
- To apply mathematical approaches, concepts, skills, methods and/or theories in a work-based context.
- To develop highly-valued transferable and professional skills during a work placement, providing a competitive edge in the graduate job market.
- To enable students to learn about an organisation and its area of work, providing an excellent opportunity to evaluate further career paths.
- On completion of the degree, students will have gained a valuable insight into a field of employment relating to Mathematics and have developed associated skills.

4: Intended learning outcomes

Information provided by Department of Mathematics

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

5: Knowledge and understanding

Information provided by Department of Mathematics

A1 Fundamental concepts and techniques of calculus, algebra, analysis and selected topics in geometry, mathematical modelling, probability and statistics.

A2 More advanced concepts in abstract algebra, real analysis and complex analysis

A3 A selection of specialist topics in Mathematics and Statistics.

A4 Software for the analysis of numerical data.

A5 Software supporting presentations and producing reports

A6 Demonstrate a range of transferable skills including initiative, independence and professional awareness.

Learning and Teaching

Formal lectures (A1-A5), tutorials (A1-A4), examples classes (A1-A4), practical classes (A4 - A5), help-desk encounters (A1), student-initiated informal meetings with lecturers (A1-A4), coursework (A1-A4). Project consultations (A1-A4) for students who have chosen the appropriate module.

During their year in industry students will embed themselves within a working environment, allowing for the development of a range of transferable and life skills commensurate with outcome A6. Furthermore, students on this scheme will have the potential to utilize the knowledge and skills associated with other outcomes developed at Levels 1 and 2. This will be in part dependent on the nature of the organisation at which they undertake the year in industry.

Assessment Strategies and Methods

Unseen written examinations (A1-A3), open-book practical examinations (A1 - A4), coursework (A1-A4).
Project reports/presentations (A1 - A5), if appropriate

6: Skills and other attributes

Information provided by Department of Mathematics

10.2.1 Intellectual Skills

B1. Calculate and manipulate data obtained from, or related to, the bodies of knowledge studied

B2 Apply a range of concepts and principles in well-defined mathematical or statistical contexts, showing judgement in the selection and application of tools and techniques.

B3 Develop and evaluate logical arguments

B4 Abstract the essential elements of problems, formulate them in a mathematical context and obtain solutions by appropriate methods

B5 Demonstrate experience of working in a professional environment

Learning and Teaching

Formal lectures, tutorials, examples classes, practical classes, revision workshops, help-desk encounters, student-initiated informal meetings with lecturers. Project consultations for students who have chosen the appropriate modules. Skills B1-B4 are developed in all these learning situations. Outcome B5 will be achieved by completing an extended period at a suitable workplace.

Assessment Strategies and Methods

Unseen written examinations, open-book practical examinations, coursework, presentations. Project report. Skills B1-B4 are assessed by all these assessment methods

10.2.2 Professional practical skills / Discipline Specific Skills

By the end of their programme, all students are expected to be able to demonstrate:

C1 Present arguments and conclusions effectively and accurately

C2 Use computer software to analyse and interpret data

C3 Use computer software to support presentations and produce reports

C4 Apply discipline-specific principles, methods, approaches, concepts, skills and/or theories in a professional context, as well as understanding the challenges of working in a professional environment

Learning and Teaching

Formal lectures, tutorials, examples classes, practical classes, revision workshops, help-desk encounters, student-initiated informal meetings with lecturers. Project consultations for students who have chosen the appropriate modules.

Skill C1 is developed in all these learning situations and skills C2-C3 in practical classes. The professional skills identified in C4 will be primarily developed through spending a year in industry.

Assessment Strategies and Methods

Unseen written examinations (C1), open-book practical examinations (C2), coursework (C1 - C2), project report/presentations (C1 - C3), if appropriate.

7: Transferable/Key skills

Information provided by Department of Mathematics

By the end of their programme, all students are expected to be able to demonstrate:

D1. Apply general mathematical skills to the interpretation of numerical data

D2 Work as a member of a team

D3 Use information technology effectively to manage information

D4 Manage time and resources effectively

D5 Develop effective learning skills

D6 Be aware of the need to plan for employment and of the need to develop various skills for such employment

D7 Work independently

D8 Professionalism and an understanding of commercial/professional pressures

Learning and Teaching

Skill D1 is developed in all learning environments in the Department of Mathematics and assessed by all assessment methods. Skill D2 is developed during practical classes. Skill D3 is developed primarily in practical classes and assessed by open-book examinations and coursework. Skill D3 is also developed through the use of e-mail, which is a normal means of communication between staff and students. Skills D4 and D5 are developed in an induction session on study skills, and in preparing set coursework and submitting it by given deadlines. Skills D4 and D5 are not explicitly assessed. Skill D6 is developed at meetings with Personal Tutors, at occasional recruitment meetings arranged for final-year students in the Department of Mathematics and in interactions with the Careers Advisory Service. Skills D4, D5 and D7 are developed by independent study for an optional project. The professional skills identified in D8 will be primarily developed through spending a year in industry.

Assessment Strategies and Methods

Unseen written examinations (D1), open-book practical examinations (D1-D3), coursework (D1, D3, D4, D7), project report/presentations (D1 - D4), if appropriate.

8: Work-based learning (where appropriate)

9: What is the structure of the programme?

Year 1 Core modules

Core (100 Credits)

Name	Module Code	Credits	Semester
Coordinate and Vector Geometry	MA10110	10	Semester 1
Probability	MA10310	10	Semester 1
Algebra	MA10510	10	Semester 1
Mathematical Analysis	MA11110	10	Semester 2

Differential Equations	MA11210	10	Semester 2
Statistics	MA11310	10	Semester 2
Calculus	MP10610	10	Semester 1
Further Algebra and Calculus	MP11010	10	Semester 2
Career Planning and Skills Development	MP12910	10	Semester 2
Classical Dynamics	PM14010	10	Semester 1

Year 1

Electives Choose 20 credits, as advised by the mathematics department

Year 2 Core modules

Core (60 Credits)

Name	Module Code	Credits	Semester
Linear Algebra	MA21410	10	Semester 2
Complex Analysis	MA21510	10	Semester 2
Introduction to Numerical Analysis and its applications	MA25200	0	Semester 1
Introduction to Numerical Analysis and its applications	MA25220	20	Semester 2
Applied Statistics	MA26600	0	Semester 1
Applied Statistics	MA26620	20	Semester 2

Core (20 Credits)

Name	Module Code	Credits	Semester
Mathematical Physics	PM26020	20	Semester 1

Year 2

Options Choose 40 credits from the list below, as advised by the department.

Name	Module Code	Credits	Semester
Real Analysis	MA20110	10	Semester 1
Introduction to Abstract Algebra	MA20310	10	Semester 1
Hydrodynamics 1	MA25610	10	Semester 2
Advanced Dynamics	MA25710	10	Semester 2
Distributions and Estimation	MA26010	10	Semester 1
Dadansoddiad Real	MT20110	10	Semester 1
Hydrodynameg 1	MT25610	10	Semester 2

Year 3 Core modules

Core (120 Credits) During your year in industry your registration will be:

Name	Module Code	Credits	Semester
Mathematics Year in Industry	MAS0100	0	Semester 1
Mathematics Year in Industry	MAS0160	60	Semester 2
Mathematics Year in Industry	MAS0200	0	Semester 1
Mathematics Year in Industry	MAS0260	60	Semester 2

Final Year Core modules

Final Year

Options Choose 90 - 120 credits from the list below.

Name	Module Code	Credits	Semester
Group Theory	MA30110	10	Semester 1
Norms and Differential Equations	MA30210	10	Semester 1
Differential Geometry of Curves and Surfaces	MA30510	10	Semester 1
Graphs and Networks	MA32410	10	Semester 2
Topology	MA32610	10	Semester 1
Integral Transforms	MA33310	10	Semester 1
Partial Differential Equations	MA34110	10	Semester 1
Asymptotic Methods in Mechanics	MA34210	10	Semester 2
Hydrodynamics ii	MA34610	10	Semester 1
Mathematical Models of Biological Systems	MA34920	20	Semester 2
Topics in Biological Statistics	MA35210	10	Semester 2
Comparative Statistical Inference	MA36010	10	Semester 2
Linear Statistical Models	MA36510	10	Semester 1
Lebesgue Integration	MA37010	10	Semester 2
Probability and Stochastic Processes	MA37410	10	Semester 2
Stochastic Models in Finance	MA37810	10	Semester 1
Operator Algebra	MA38310	10	Semester 2

Project in Mathematics or Statistics	MA39910	10	Semester 1
Project in Mathematics or Statistics	MA39910	10	Semester 2
Normau a Hafaliadau Differol	MT30210	10	Semester 1
Graffiau a Rhwydweithiau	MT32410	10	Semester 2
Hafaliadau Differol Rhannol	MT34110	10	Semester 1
Dulliau Asymptotig mewn Mecaneg	MT34210	10	Semester 2
Cyflwyniad i Addysgu Mathemateg mewn Ysgol Uwchradd	MT39020	20	Semester 1
Prosiect Mewn Mathemateg neu Ystadegaeth	MT39910	10	Semester 1
Prosiect Mewn Mathemateg neu Ystadegaeth	MT39910	10	Semester 2

Electives Choose 0 - 30 credits (level 3) as advised by the department, subject to pre-requisites

10: University Regulations

Details of University Regulations can be found at <https://www.aber.ac.uk/en/academic-registry/handbook/regulations/>

11: Support for students and their learning

12: Entry Requirements

Details of entry requirements for the scheme can be found at <https://courses.aber.ac.uk/>

13: Methods for evaluating and improving the quality and standards of teaching and learning

14: Regulation of Assessment

Academic Regulations are published as Appendix 2 of the Academic Quality Handbook: <https://www.aber.ac.uk/en/aqro/handbook/app-2/>

15: External Examiners

External Examiners fulfill an essential part of the University's Quality Assurance. Annual reports by External Examiners are considered by Faculties and Academic Board at university level.

16: Indicators of quality and standards

The Department Quality Audit questionnaire serves as a checklist about the current requirements of the University's Academic Quality Handbook. The periodic Department Reviews provide an opportunity to evaluate the effectiveness of quality assurance processes and for the University to assure itself that management of quality and standards which are the responsibility of the University as a whole are being delivered successfully.