



**UNIVERSITY OF
PORTSMOUTH**

COURSE SPECIFICATION

BSc (Hons) Mathematics with Machine Learning

COURSE SPECIFICATION

Course Title	<i>BSc (Hons) Mathematics with Machine Learning</i>
Final Award	<i>BSc (Hons)</i>
Exit Awards	<i>CertHE, DipHE, BSc.</i>
Course Code / UCAS code (if applicable)	<i>U3517PYC</i>
Mode of study	<i>Full time</i>
Mode of delivery	<i>Campus</i>
Normal length of course	<i>3 years, 4 years with placement</i>
Cohort(s) to which this course specification applies	<i>from September 2024 intake onwards</i>
Awarding Body	<i>University of Portsmouth</i>
Teaching Institution	<i>University of Portsmouth</i>
Faculty	<i>Faculty of Technology</i>
School/Department/Subject Group	<i>School of Mathematics and Physics</i>
School/Department/Subject Group webpage	https://www.port.ac.uk/about-us/structure-and-governance/organisational-structure/our-academic-structure/faculty-of-technology/school-of-mathematics-and-physics
Course webpage including entry criteria	https://www.port.ac.uk/study/courses/undergraduate/bsc-hons-mathematics-with-machine-learning
Professional and/or Statutory Regulatory Body accreditations	<i>Institute of Mathematics and its Applications (IMA)</i>
Quality Assurance Agency Framework for Higher Education Qualifications (FHEQ) Level	<i>level 4,5,6</i>

This course specification provides a summary of the main features of the course, identifies the aims and learning outcomes of the course, the teaching, learning and assessment methods used by teaching staff, and the reference points used to inform the curriculum.

This information is therefore useful to potential students to help them choose the right course of study, to current students on the course and to staff teaching and administering the course.

Further detailed information on the individual modules within the course may be found in the relevant module descriptors and the Course Handbook provided to students on enrolment.

Please refer to the [Course and Module Catalogue](#) for further information on the course structure and modules.

Educational aims of the course

The course aims to equip students for work as professional mathematicians in general, but in particular to provide them with specialist skills to work in the machine learning and artificial intelligence sectors. In addition, and more generally, the course aims to:

- Maintain the quality of mathematics teaching expected from a TEF gold-rated university (awarded 2023)
- Provide a challenging, stimulating and self-rewarding study environment.
- Provide a framework whereby individual study paths may be forged based on choice from a range of options.
- Enable students to broaden their studies by selecting a language as a substitute for a degree option choice at level 5.
- Develop a range of key skills by means of opportunities provided in the study units.
- Accommodate student needs in relation to maximising their career potential by enabling them to develop knowledge, understanding and skills in their chosen subject area.
- Promote career enhancing activities and aspirations by developing “soft skills” also known as “graduate skills”.
- Maintain a high level of employability

This course will interest students seeking mathematically based careers in a variety of sectors, but with particular emphasis in the ever growing tech and AI sector.

Course Learning Outcomes and Learning, Teaching and Assessment Strategies

The [Quality Assurance Agency for Higher Education \(QAA\)](#) sets out a national framework of qualification levels, and the associated standards of achievement are found in their [Framework for Higher Education Qualifications](#) document.

The Course Learning Outcomes for this course are outlined in the tables below.

A. Knowledge and understanding of:			
LO number	Learning outcome	Learning and Teaching methods	Assessment methods
A1	General principles and techniques in Mathematics, Statistics, Operational Research, Linear Algebra, modelling, numerical methods, and pure mathematics. (MSOR 3.8, 3.9, 3.14, 3.16, 3.18, 3.19).	lectures tutorials computer labs	Coursework In-class test/CBT written exam
A2	Computing principles, software processes and computer packages (MSOR 3.17).	lectures computer labs	coursework/CBT
A3	Codes of Practice and the ethical conventions that underpin practice (MSOR 3.26)	seminars tutorials	reports presentations

MSOR = Mathematics, Statistics and Operations QAA Subject Benchmark Statement
<https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-mathematics-statistics-and-operational-research> or click [here](#)

B. Cognitive (Intellectual or Thinking) skills, able to:			
LO number	Learning outcome	Learning and Teaching methods	Assessment methods
B1	Develop general and critical abilities of an intellectual, analytical, creative and problem-solving nature in a mathematical context.	<i>lectures, tutorials, labs</i>	<i>coursework written exam presentation</i>
B2	Develop critical skills with regard to literature searching, appraising and evaluating from a variety of sources and synthesising the results.	<i>supervised project, seminars</i>	<i>Dissertation Coursework</i>
B3	Plan and execute a significant piece of independent study at final year level and report on it.	<i>supervised project, seminars</i>	<i>Dissertation coursework</i>

In alignment with MSOR Benchmark 3.25

C. Practical (Professional or Subject) skills, able to:			
LO number	Learning outcome	Learning and Teaching methods	Assessment methods
C1	Reflectively formulate mathematical models for the resolution of problem or requirement specifications	<i>lectures, tutorials</i>	<i>coursework written exam</i>
C2	Give critical advice on the use of a given mathematical model.	<i>lectures, computer labs</i>	<i>coursework written exam</i>
C3	Use professional judgement in the selection and use of industry standard software for specific purposes.	<i>lectures computer labs</i>	<i>coursework dissertation</i>
C4	Create statistical models and selectively process the data against selected inferential tests.	<i>lectures computer labs</i>	<i>coursework dissertation</i>
C5	Use industry standard software for specific purposes.	<i>computer labs</i>	<i>coursework</i>

In alignment with MSOR Benchmark 3.25 – 3.27

D. Transferrable (Graduate and Employability) skills, able to:			
LO number	Learning outcome	Learning and Teaching methods	Assessment methods
D1	Communicate effectively in appropriate forms of presentation/communication.	<i>Tutorials group problem solving</i>	<i>Individual/group presentations</i>
D2	Use information technology to handle data for simulation and analysis emphasising the application of number in the understanding and interpretation of data before and after processing.	<i>lectures computer labs</i>	<i>coursework dissertation</i>
D3	Use problem-solving techniques to formulate appropriate problem solving strategies.	<i>lectures tutorials Group sessions</i>	<i>written exam presentations</i>
D4	Work with others to achieve goals but nevertheless be distinctively individual.	<i>Group problem solving</i>	<i>group reports, presentation coursework</i>
D5	Demonstrate productive capability in the placement setting (placement students only)	<i>placement supervision</i>	<i>written report</i>

In alignment with MSOR Benchmark 3.25 – 3.27

<p>Academic Regulations</p> <p>The current University of Portsmouth Academic Regulations: Examination & Assessment Regulations will apply to this course. Approved course exemptions can be found here.</p>
<p>Support for Student Learning</p> <p>The University of Portsmouth provides a comprehensive range of support services for students throughout their course, details of which are available at the MyPort student portal. Maths Café 1-1 drop-in support is run by the School of Mathematics and Physics; further support is available from the maths learning support tutor.</p>
<p>Evaluation and Enhancement of Standards and Quality in Learning and Teaching</p> <p>The University of Portsmouth undertakes comprehensive monitoring, review and evaluation of courses within clearly assigned staff responsibilities. Student feedback is a key feature in these evaluations, as represented in our Policy for Listening to and Responding to the Student Voice where you can also find further information.</p>
<p>Reference Points</p> <p>The course and outcomes have been developed taking account of:</p> <ul style="list-style-type: none"> • University of Portsmouth Curriculum Framework Specification • University of Portsmouth Vision • Office for Students Conditions of Registration • University of Portsmouth Code of Practice for Work-based and Placement Learning • Quality Assurance Agency UK Quality Code for Higher Education

- [Quality Assurance Agency Qualification Characteristic Statements](#)
- [Quality Assurance Agency Subject Benchmark Statement](#) for **Mathematics, Statistics and Operational Research (MSOR)**
- [Quality Assurance Agency Framework for Higher Education Qualifications](#)
- Requirements of Professional and/or Statutory Regulatory Bodies: [Institute of Mathematics and its Applications \(IMA\)](#)
- Vocational and professional experience, scholarship and research expertise of the University of Portsmouth's academic members of staff
- National Occupational Standards

Changes to your course/modules

The University of Portsmouth has checked the information provided in this Course Specification and will endeavour to deliver this course in keeping with this Course Specification. However, changes to the course may sometimes be required arising from annual monitoring, student feedback, and the review and update of modules and courses.

Where this activity leads to significant changes to modules and courses there will be prior consultation with students and others, wherever possible, and the University of Portsmouth will take all reasonable steps to minimise disruption to students.

It is also possible that the University of Portsmouth may not be able to offer a module or course for reasons outside of its control, for example, due to the absence of a member of staff or low student registration numbers. Where this is the case, the University of Portsmouth will endeavour to inform applicants and students as soon as possible, and where appropriate, will facilitate the transfer of affected students to another suitable course.

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