University of Plymouth

Faculty of Science and Engineering

School of Geography, Earth and Environmental Science

Programme Specification

Master of Science (MSc)
in
Data Science and Environmental Intelligence

7575 (Full Time)
7576 (Part Time)

September 2025

1. **MSc Data Science and Environmental Intelligence**

   Final award title: MSc Data Science and Environmental Intelligence

   Level 7 Intermediate award title(s):
   Completion of 60 credits: Postgraduate Certificate

   Level 7 Intermediate award title(s):
   Completion of 120 credits: Postgraduate Diploma

   UCAS code N/A

   HECOS code 100381

2. **Awarding Institution:** University of Plymouth

   Teaching institution(s): University of Plymouth

3. **Accrediting body**: Once approved, this new programme will apply for accreditation under the Institute of Environmental Management & Assessment (IEMA) approved University Partner. Scheme.

4. **Distinctive Features of the Programme and the Student Experience**

The distinctive strengths of the MSc Data Science and Environmental Intelligence are:

- An industry-informed syllabus, equipping graduates from a variety of undergraduate degrees with broad professional competence in one of the world economy's most sought-after postgraduate subject areas, aligned to global Sustainability Development Goals.
- Offering modules in the areas of terrestrial and marine environmental observations, data modelling and computing.
- Providing a flexible individual research project supervised by world-leading Marine/Environmental Researchers and Data Scientists.
- Establishing high proficiency in the use and application of state-of-the-art programming languages in the field of Environmental Science.
- Developing modern analytics expertise for obtaining business, scientific and

social insights from Big Data sources and online social networks.

The first three Semester 1 modules teach the analytical approach as a whole, including quality control of data at source and calibration. Alongside this module students undertake two instructive modules learning key math's and computing skills associated data science. The modules in Semester 2 focus on application of these key skills to the modelling of large datasets, along with handling terrestrial and marine sensor networks. After completion of the taught programme and dissertation, students have the opportunity to consolidate their learning by undertaking an optional, 6-12month industry placement, leading to the award of the University's certificate of professional practice.

5. Relevant QAA Subject Benchmark Group(s)

There is no specific Masters-level Data Science and Environmental Intelligence benchmark group. Therefore, when designing the programme, we have employed the most appropriate benchmarking, namely

- Earth Sciences, Environmental Sciences and Environmental Studies
- Mathematics, Statistics and Operational Research
- Computing
- the QAA 'Masters' Degree Characteristics

This programme has also been designed so that it adheres to the Office for Students - Sector Recognized Standards, in respect to the University's conditions of registration.

6. Programme Structure

Full Time Route

Semester 1	**MATH517:** Big Data Visualisation and Analytics 20 credits	**COMP5000:** Software Development and Databases 20 credits	**GEES531:** Environmental Observations and Quality Assurance 20 credits	**APIE502:** Placement Preparation 0 credits
Semester 2	**MATH518:** Applied Data Modelling and Artificial Intelligence 20 credits	**GEES535:** Terrestrial Environmental Sensors and Big Data 20 credits	**MAR538:** Marine Environmental Monitoring 20 credits	

Semester 3	**GEES520:** MSc Dissertation* or **PROJ522:** MSc Dissertation* 60 credits
Optional placement year following completion of the taught programme **APIE503:** Industry Placement 0 credits	

* Choice of dissertation module will depend upon the nature (terrestrial or marine) of the dissertation project the student chooses to do. The dissertation project choice process will be covered in GEES531.

Part Time Route (Credits as above)

Stage 1, Semester 1 : GEES531 Environmental Observations and Quality Assurance
MATH517 Big Data Visualisation and Analytics

Stage 1, Semester 2: MATH518 Applied Data Modelling and Artificial Intelligence
GEES535 Terrestrial Environmental Sensors and Big Data

Stage 2, Semester 1: COMP5000 Software Development and Databases
Stage 2, Semester 2: MAR538 Marine Environmental Monitoring

Stage 2, Semester 2: GEES520 or PROJ522*

Optional placement year following completion of the taught programme:

APIE503: Industry Placement

7. Programme Aims

The MSc Data Science and Environmental Intelligence programme shares the following general aims with other MScs in the Faculty of Science and Engineering:

- To be informative and challenging, and to establish an advanced knowledge base suitable for a career in relevant industries;
- To provide students holding a variety of entry qualifications with an opportunity to advance their potential by significantly expanding their knowledge and skills base;

- To enrich curriculum content through the professional and research expertise of a broad staff base and extensive external links;
- To develop a wide range of subject-specific and generic key skills, such as critical research awareness, creative problem-solving, effective team-working and up-to-date ICT familiarity, that will facilitate continuing professional development and life-long learning;
- To create critical, rational, innovative, self-reflective and creative thinkers who are highly employable, confident and adaptable and who can progress rapidly in their chosen profession.

In addition, the MSc Data Science and Environmental Intelligence programme has the following programme specific aims:

- To deliver a contemporary, multidisciplinary curriculum in environmental observations and data science, that provides students with opportunities to apply acquired field and remote sensing techniques critically, to develop strategic solutions in an ever more data-dependent world, taking account of the importance of quality control, basic data protection and security issues;
- To develop a high standard of theoretical and practical competence in the use of software for manipulating, visualizing and modelling structured and unstructured data, together with a broad awareness of computational tools used in analytics applications;
- To provide an up-to-date tool set, including sentiment analysis, for extracting deep insights relevant to business, science or society from social media and other sources;
- To cultivate generic skills in structured, methodological programming practice and specific knowledge of computer architectures and data representation mechanisms that allow computational solutions to real-world analytics problems to be critically identified and strategically produced;
- To offer modules in marine and environmental observations that provide cutting-edge exposure to an advanced and broad range of research topics;
- To develop an enhanced ability to communicate effectively critiqued complex technical and professional concepts around environmental and sustainability goals, including some of their social and ethical aspects, to specialized and non-specialized audiences using modern presentational tools.

8. Programme Intended Learning Outcomes

8.1. Knowledge and understanding

On successful completion graduates should have developed:

1) a broad range of subject-specific concepts for effective and integrated data science and environmental analytics;
2) fundamental and advanced data science and environmental analytics techniques for the efficient solution of a wide range of important problems including data visualization and information extraction;
3) current practice, issues and developments in data science and environmental analytics to allow a critical evaluation of existing challenges and new insights.

8.2. Cognitive and intellectual skills

On successful completion graduates should have developed the ability to:

1) plan, conduct and report a self-directed and substantial programme of critically evaluated research in contemporary areas of data science and environmental analytics enquiry;
2) critically analyse and identify limitations in current practice and creatively identify avenues for further development, exploration or explanation;
3) systematically produce work which applies to and is informed by research and practice at the forefront of societal developments in data science and environmental analytics.

8.3. Key and transferable skills

On successful completion graduates should have developed the ability to:

1) effectively communicate and translate complex ideas, principles and theories by well-reasoned oral, written and visual arguments to technical and non-technical audiences;
2) critically engage in the peer review process to evaluate the rigor, validity and feasibility of developments in research and practice;
3) set goals and identify resources for effective continuing professional development and autonomous life-long learning.

8.4. Employment related skills

On successful completion graduates should have developed:

1) the professional exercise of strongly developed personal and inter-personal skills to facilitate efficient individual or teamwork;
2) a systematic approach to problem solving and decision-making in complex and unpredictable situations, identifying avenues for innovation;
3) a facility for engaging critically in self-awareness, self-reflection and self-management in a rapidly changing global context.

8.5. Practical skills

On successful completion graduates should have developed the skills to:

1) efficiently identify and visualize the underlying patterns in a range of data sources using up-to-date software;
2) turn such information into critically appraised innovative insights for business, scientific or social innovation;
3) consistently apply knowledge and subject-specific and wider intellectual skills to deal with complex issues both systematically and creatively.
4) hands on field skills and practical understanding of the use of sensors

9. Admissions Criteria, including APCL, APEL and Disability Service arrangements

The Programme Leader (who is also responsible for admissions) uses the criteria below to guide their admissions decisions. Wherever possible, established relationships or equivalencies to other international qualifications will be used in making decisions.

Students admitted to the MSc programme are expected to have a good Honours degree (a second class or better) in a relevant discipline e.g., Environmental Science, Geology. Earth Sciences, Geography, Marine Sciences, Ocean Science, Mathematics, Computing. The Programme Leader is responsible for ensuring that applicants have, through prior learning (acquired by formal study and/or experience) in the critical subject areas, developed the requisite knowledge, understanding and skills required for successful participation in this programme. Candidate suitability is assessed through a combination of the written application, evidence of formal qualifications, personal references and candidate interviews (where appropriate).

In compliance with the University's policies of equality and diversity, and disability, all appropriately qualified applicants will be given equal consideration during the selection process. The University welcomes applications from people with disabilities and the support available is described here.

10. Entry requirements (in summary):

1. An Honours degree (a second class or better) in a relevant discipline (e.g., BSc Geography, Environmental Science, Geological Sciences, Earth Sciences Marine Science, Ocean Science, Mathematics, Computing, Engineering) OR overseas equivalent. If you apply with a degree in a non-related subject, then this will also be considered.
2. A minimum grade C in English Language at GCSE level OR a minimum overall score of 6.5 in IELTS with no less than 5.5 in any component.

11. Accreditation of Prior Certificated Learning (APCL)

Students can exceptionally apply for exemption from any modules through APEL or APCL, following standard University procedures, as described in the current University regulations on admissions. This decision will be made by the Programme Leader.

12. Progression criteria for Final and Intermediate Awards

Successful completion of the final and intermediate awards, including the award of the MSc with Merit and Distinction, is as set out in the University's current academic regulations.

The optional placement year does not contribute credits to the degree but leads to the University's Certificate of Professional Experience if successfully completed

13. Non-Standard Regulations

One module – COMP5000 (20 credits) is a non- compensatable module.

14. Transitional Arrangements

2024/25	**2025/26**
MATH501	MATH518
MATH513	MATH517
MAR524	PROJ522

Appendices
Programme Specification Mapping (PGT)

Programme Specification Mapping (PGT): module contribution to the meeting of Award Learning Outcomes
Tick those Award Learning Outcomes the module contributes to through its assessed learning outcomes.

Module	**Credits**	**C**ore **E**lective	8.1 Knowledge & understanding			8.2 Cognitive & intellectual skills			8.3 Key & transferable skills			8.4 Employment related skills			8.5 Practical skills				Compensation Y/N	**Assessment element(s) and weightings** [use KIS definition] E1 - exam E2 - clinical exam T1 - test C1 - coursework A1 - generic assessment P1 – practical O1 – Open book assessment
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	4		
MATH517	20	C	X	X	X		X	X	X			X	X		X	X	X		Y	C1 100%
COMP5000	20	C	X	X	X		X	X	X				X		X		X		N	C1 100%
GEES531	20	C			X		X	X		X	X	X		X	X		X		Y	C1 100%
Learning Outcomes 60 credits			X	X	X		X	X	X	X	X	X	X	X	X	X	X			
MATH518	20	C	X	X	X		X	X	X			X	X		X	X	X		Y	C1 100%
GEES535	20	C	X	X	X		X	X	X	X	X	X	X		X		X	X	Y	C1 60% P1 40%
MAR538	20	C	X	X	X		X		X						X		X	X	Y	C1 60% P1 40%
Learning Outcomes 120 credits			X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		
GEES520	60	O	X	X		X	X	X		X	X	X	X	X	X	X	X	X	N	C1 100%
PROJ522	60	O	X	X		X	X	X		X	X	X	X	X	X	X	X	X	N	C1 100%
Learning Outcomes 180 credits			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Confirmed Award LOs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		