Programme Specification (Postgraduate) FOR ENTRY YEAR: 2026/27

Date created: 19/9/23 **Last amended:** 19/06/2024 **Version no.** 1 **Date approved by EQED:** 06/02/2024

Please note, this programme is currently undergoing review as part of the University's continuous cycle of curriculum enhancement. The information in Appendix 1 represents the current structure and content of the programme. Any future enhancements to the programme in terms of content will be communicated to applicants and offer holders once finalised.

1. Programme title(s) and code(s):

MSc Environmental Data Science

MSc Environmental Data Science with Industry

PG Dip/PG Cert* Environmental Data Studies

Notes

* An award marked with an asterisk is only available as an exit award and is not available for students to register onto.

a) HECOS Code

HECOS Code	%
100381	50%
100370	30%
100956	10%
100992	10%

2. **Awarding body or institution:** University of Leicester

3. a) Mode of study Full-time a

b) Type of study Campus-based

4. Registration periods:

MSc in Environmental Data Science

The normal period of registration is 12 months (full time) .

The maximum period of registration for the Msc is 24 months (full time)

PG Dip in Environmental Data Studies

The normal period of registration is 12 months (full time)
The maximum period of registration for the PG Dip is 24 months (full time)

Note: Normal and maximum periods of full-time registration for the 'with industry' MSc variant accommodate an extra period of registration corresponding to the placement duration, such that normal period is between 21 and -24 months (dependent on length of placement obtained) and the maximum period is 36 months.

5. Typical entry requirements

Students are required to have a first, upper second or lower second class honours degree (or equivalent) in any subject or several years appropriate professional experience. However, students with nonstandard qualifications are expressly encouraged to apply and will be considered on a case-by-case basis. In particular we give due consideration to prior professional experience gained by mature students in relevant areas of work. In such cases applicants would be expected to provide detailed information on work experience to enable its full evaluation by admissions staff. We also consider alternative qualifications, for example in different subject areas, where these are supported by relevant experience within the field of the MSc programme. Students for whom English is not their first language are required to achieve a minimum IELTS score of 6.5 with at least 6 in all four categories.

6. Accreditation of Prior Learning

No accredited prior learning would be accepted for exemption from modules on the programme.

7. Programme aims

Whether working in the fields related to the geosphere (the solid earth), the biosphere (ecology), the hydrosphere (oceans and freshwater), the atmosphere (meteorology, climate and climate change) or their interactions and inter-relationships, Environmental Scientists increasingly need strong data manipulation, analysis and visualisation skills. The interdisciplinary MSc in Environmental Data Science teaches students data-driven approaches to understanding environmental processes and how they can be used to inform societal responses to contemporary environmental challenges and aid sustainable decision-making. The uptake, use, and commercialisation of environmental data demands expertise in Data Science and you will be trained in a broad range of data science techniques. These skills are not limited to a career focused on applications of environmental data analyses. They address the shortage of qualified data scientists in the UK and abroad and will place you in a strong position for a career in a range of data science sectors. Students taking the 'with industry' version of this degree can seek placements with a range of commercial, industrial and governmental organisations seeking to leverage environmental data.

In addition, for the 'with Industry' variants

The 'Year in industry' variant of this programme is in accordance with the University's standard model

8. Reference points used to inform the programme specification

- QAA Benchmarking Statement
- Framework for Higher Education Qualifications (FHEQ)
- UK Quality Code for Higher Education
- Education Strategy
- University Assessment Strategy [log in required]
- University of Leicester Periodic Developmental Review Report
- External Examiners' reports (annual)
- United Nations Education for Sustainable Development Goals
- Student Destinations Data

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9. Programme Outcomes

Unless otherwise stated, programme outcomes apply to all awards specified in 1. Programme title(s).

MSc Environmental Data Science

a) Discipline specific knowledge and competencies

i) Knowledge

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: explain and illustrate, using examples, how data science techniques can be used to increase our understanding of environmental system dynamics and change, inform environmental management and support sustainable decision-making;	Lectures; tutorials; seminars; practical classes/workshops; project supervision; guided independent study	Practical exercises; discussions, worksheets; project supervision guided reading	Report; exam, practical exercise; project
describe what is meant by data science, its key principles and practices;	Lectures; seminars; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; guided reading	Report; exam; project;
apply techniques of data science to applications of environmental data analyses.	Lectures; practical classes/workshops; tutorials; project supervision	Practical exercises; discussions, worksheets; project supervision; guided reading	Practical exercise; report; exam; project

ii) Concepts

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: critically evaluate the conceptual basis of different data-driven approaches to exploring environmental system behaviour, their workflows and the contributions they can make understanding and managing our environment.	Lectures; seminars; tutorials; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided reading	Report; exam; project; practical exercise

iii) Techniques

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: plan and build scripts (shell or notebook) using open-source programming languages such as R or Python to process geographical data;	Lectures; tutorials; project supervision; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided reading	Project; practical exercise; report; exam
deploy a range of specialised data wrangling techniques to structure and manipulate data and metadata;	Lectures; tutorials; project supervision; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided reading	Project; practical exercise
apply a variety of data-driven analytical approaches (e.g. statistical methods and numerical models) to gain insight from environmental data and explore environmental system dynamics and change;	Lectures; seminars; tutorials; project supervision; practical classes/workshops; independent study	Practical exercises; discussions, worksheets; project supervision; guided and independent reading	Project; exam; report; practical exercise; dissertation

design and create effective visualisations of environmental data and analyses;	Lectures; practical classes/workshops; tutorials; independent study	Practical exercises; discussions, worksheets; guided and independent reading	Project; dissertation
employ bespoke and off-the-shelf software to describe and explain environmental system behaviour, including conducting an assessment of uncertainty and sensitivity.	Lectures, practical classes/ workshops; tutorials; project supervision	Practical exercises; discussions, worksheets; project supervision; guided reading	Report; exam; practical exercise; project

iv) Critical Analysis

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: critically analyse and interpret environmental data in the context of key social, economic and scientific debates;	Lectures; seminars; practical classes/workshops; tutorials, project supervision; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided and independent reading	Project; exam; report; practical exercise; dissertation
describe and evaluate the challenges, biases and limitations of analysing environmental data using different data science approaches;	Lectures; seminars; tutorials; project supervision; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided and independent reading	Report; exam; project; practical exercise; dissertation
utilise data and model outputs to inform environmental decision making.	Lectures; tutorials; project supervision; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided and independent reading	Report; exam; practical exercise; modelling project; dissertation

v) Presentation

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type

Students should be able to: present environmental data, analyses and arguments in a variety of formats and to a variety of audiences.	Lectures; seminars; tutorials; project supervision; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided and independent reading	Report; exam; project; practical exercise; dissertation

vi) Appraisal of evidence

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: identify important sources of environmental data	Lectures; practical classes/workshops; fieldwork; tutorials; guided independent study	Practical exercises; discussions, worksheets; project supervision; fieldwork activities; guided reading	Essay; report; practical exercise; project
critically appraise environmental data and data analyses in problem solving contexts.	Lectures; fieldwork; workshops/practical classes; guided independent study	Practical exercises; worksheets; fieldwork activities; guided reading	Exam; report

b) Transferable Skills

i) Research Skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: use library resources and conduct literature searches in support of their learning;	Lectures; practical classes/workshops; tutorials; project supervision	Discussions; workshop exercises; project supervision; guided and independent reading	Research proposal; dissertation
read, analyse and reflect critically on scientific texts and other source materials;	Lectures; practical classes/workshops; tutorials; project supervision	Discussions; workshop exercises; project supervision; guided and independent reading	Research proposal; dissertation
design, execute, and write-up a piece of research within a specific physical or socio-economic context that is	Lectures; practical classes/workshops; tutorials; project supervision	Discussions; workshop exercises; project supervision; guided and independent reading	Research proposal; dissertation

bounded by concepts of data science and utilizes appropriate environmental data or data products.			

ii) Communication skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: communicate effectively in a variety of written and oral formats.	Lectures; seminars; practical classes/ workshops; seminars; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided and independent reading	Report; exam; project; essay; oral presentation; briefing paper; research proposals

iii) Data Presentation

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: explain and discuss fundamental concepts related to presenting data textually and visually;	Lectures; practical classes/workshops; guided independent study	Practical exercises; discussions, worksheets; project supervision; guided reading	Project; report
critique different visualisation methods and design effective data visualisations using software tools or scripting languages.	Lectures; practical classes/workshops; guided independent study	Practical exercises; worksheets; guided reading	Project; report

iv) Information Technology

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: demonstrate competence in a range of software tools and scripting languages for the processing, analyses and visualisation of environmental data.	Lectures; practical classes/workshops; guided independent study	Practical exercises; worksheets; discussions; project supervision; guided reading	Project

v) Problem Solving

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: analyse environmental problems to identify the role of data science and numerical modelling in formulating solutions and map the stages of problem solving onto data science workflows	Lectures; practical classes/workshops; tutorials; project supervision; guided independent study	Practical exercises; worksheets; discussions; project supervision; guided and independent reading	Project; exam, practical exercise; report; research proposal; dissertation

vi) Working relationships

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: work effectively and collaboratively with their peers and staff (discuss ideas, formulate plans, organise time/allocate tasks, offer and receive constructive criticism) to produce data products, reports and presentations.	Lectures, practical classes/workshops; tutorials; seminars; project supervision; seminars; guided independent study	Practical exercises; worksheets; discussions; project supervision; guided and independent reading	Research proposal; dissertation; essay; report; project

vii) Managing learning

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: effectively engage with different formal and informal learning opportunities;	All modules. All teaching methods	All learning activities	All assessment types
organise and manage their time to meet targets and deadlines.	All modules. All teaching methods	All learning activities	All assessment types

viii) Career Management

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: demonstrate an awareness and understanding of their employability skills and strengths (an ability to work independently/part of a team, critical/creative thinking, programming, time management, leadership etc);	Discussions with Personal Tutors; engagement with Careers and Employability Service	Reflective activities; online quizzes	Online quizzes (Formative Assessment)
engage with career and personal development planning that support students to secure careers in a range of industrial, commercial, governmental and non-governmental job markets;	Workshops run jointly by SGGE and CES on Postgraduate career options and planning; participation in School, College and University careers events, engagement with Personal Tutors; engagement with Careers and Employability services.	Application coaching; career coaching; mock interviews/assessments; business coaching; CV writing workshops.	Online quizzes (Formative Assessment)
describe and reflect upon the roles of Data Science and the Environmental Data Scientist in contributing to and delivering collaborative projects in a range of interdisciplinary	Lectures; seminars; practical classes/workshops; guided independent study	Practical exercises; worksheets; discussions; guided reading	Report; exam; briefing paper; oral presentation

management and policy-setting contexts.			

For the Year in Industry variant, the additional programme outcomes apply

PG Diploma

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Intended Learning Outcomes for this award remain similar to the full MSc programme. However, it is recognised that outcomes that are predominately demonstrated by the dissertation will not be as effectively met.	Teaching methods for this award remain similar to the full MSc programme. However, it is recognized that for the PG Diploma there will be no teaching associated with the dissertation	Learning activities for this award remain similar to the full MSc programme. However, it is recognised that for the PG Diploma the dissertation will not be a learning activity	Assessment types for this award remain similar to the full MSc programme. However, it is recognised that the dissertation will not be used as a method to evidence any of the learning outcomes

10. Progression points

This programme follows the standard Scheme of Progression set out in Senate Regulations – see the version of *Senate Regulation 6 governing postgraduate programmes* relevant to the year of entry.

a) Course transfers

n/a

b) Year in Industry

For the Year in Industry variant the additional progression points apply

1. If a student does not achieve a pass level (50% or above) in all semester 1 taught modules level they will normally revert to the degree without industry. A Progression Board of Examiners will be held after semester 1 which will determine if students remain on the "with industry" variant of their programme.

2. If a student does not achieve a pass level (50% or above) in all semester 2 taught modules they have the option of reverting to the degree without industry, or if they wish to remain on "with industry" programme, they must delay any plans for placements until September and they must pass any resits in July/August. A Progression Board of Examiners will be held after semester 2 and also after the reassessment period which will determine if students remain on the "with industry" variant of their programme.

3. If a student fails to secure a placement by June 1 (or alternative date set by CDS) in their second semester of study, then they will normally revert to the degree without industry.

4. If the industrial placement ends early due to the behaviour of the Placement Student not being in accordance with the University's Regulations for Students, Student Responsibilities. The Placement Student they will normally revert to the degree without industry and will need to return to the University to carry out an in-house dissertation in the School or Department, as per the without industry degree. To prevent such an incident from happening, processes are in place to identify any possible issues or concerns early in the industrial placement role. This includes a start check, regular communications, visits to the workplace (physical and/or virtual) and evaluation. Communication and contact between the Placement Student, Placement Provider and University provides support should issues arise.

5. If the student discontinues their industrial placement then they will normally revert to the degree without industry and carry out an in-house project in the School or Department, as per the without industry degree.

11. Criteria for award and classification

This programme follows the standard scheme of postgraduate award and classification set out in Senate Regulations – see the version of *Senate Regulation governing postgraduate programmes* relevant to the year of entry.

12. Special features

Embedding the teaching of generic Data Science skills within specific (environmental) disciplinary contexts

For the Year Industry variant the additional Special Features apply

12a. Research-inspired Education

Students on this programme will advance through the four quadrants of the University of Leicester Research-inspired Education Framework as follows:

RiE Quadrant	Narrative
	Our programme offers a solid foundation in the methods and theories of Environmental Data Science, enhancing your critical thinking and problem-solving skills through key themes such as hydrology, geochemistry, ecological science, statistics and data science. The core curriculum ensures that the knowledge and skills you gain are applicable across a range of professional environmental fields.
Research-briefed Bringing staff research content into the curriculum.	• **Research briefed** - Experience a challenging and inspiring learning environment informed by cutting-edge research. You'll benefit from the strong research background of the University of Leicester's Contemporary Earth Systems research group, experts in the School of Computing & Mathematical Sciences as well as other leading professionals from commerce and industry. Our staff bring their research straight into the classroom, making learning exciting and relevant
Research-based Framed enquiry for exploring existing knowledge.	• **Research based** - Engage in computer practicals and assessments grounded in real-world problems, data and different stakeholder perspectives. Learning in class is augmented by in-field skills training. This workshop-led, hands-on approach helps you contextualize data management, methods, and modelling.
Research-oriented Students critique published research content and process.	• **Research oriented** – Learn to critically appraise published research with expert guidance and training. You'll engage with academic literature through various classroom activities and assessments, honing your ability to think critically and analytically and to publish code to open-source repository standards.
Research-apprenticed Experiencing the research process and methods; building new knowledge.	• **Research apprenticed** – Receive comprehensive training in report writing, group work, presentation skills, reading research papers, and library skills, including the use of reference management software. Research-focused training includes topics such as types of research, stakeholder identification, project design and qualitative and qualitative methods. This training culminates in a final dissertation project, where you'll push the boundaries of knowledge in a final dissertation project based on your independent research, supported by an expert supervisor.
	Our programme develops the research expertise and confidence needed to excel in the dynamic field of Environmental Data Science.

As part of studying at a research-intensive university, students on this programme have the following extra or co-curricular opportunities available to them to gain exposure to research culture:

The School of Geography., Geology and Environment has a full programme of weekly seminars by outside speakers, to which Masters students are encouraged to attend through promotion in the SGGE newsletter and through lecture shout-outs. Staff also pen their latest research findings within the SGGE newsletter, and pin their latest journal papers to their relevant VLE module sites in a virtual noticeboard.

Teaching on this programme will be research-informed (it draws consciously on systematic inquiry into the teaching and learning process itself) in the following way:

Teaching in geographical information science draws on the body of learning and teaching research carried out during the Leicester-led HEFCE Spatial Literacy in Learning and Teaching project.

The School supports all staff involved in teaching to gain an accredited Higher Education teaching qualification, in which they demonstrate their use of teaching theory to support their own practice and reflect on their current teaching and continuing professional development.

Academic staff meet twice per year to discuss the latest developments in teaching and learning, for example most recently in regard to generative artificial intelligence. Selected staff conduct horizon scanning of the latest journal papers in Journal of Geography in Higher Education and bring ideas at the forefront of innovation to their peers.

13. Indications of programme quality

External examiners reports

For the Year Industry variant the additional indications of programme quality apply

14. External Examiner(s) reports

The details of the External Examiner(s) for this programme and the most recent External Examiners' reports for this programme can be found at exampapers@Leicester [log-in required].

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Appendix 1: Programme structure (programme regulations)

The University regularly reviews its programmes and modules to ensure that they reflect the current status of the discipline and offer the best learning experience to students. On occasion, it may be necessary to alter particular aspects of a course or module.

Environmental Data Science

Level 7/Year 1 Delivery Year 2026/27 Intake Month September Mode of Study Full Time Structure

Credit breakdown

Status	Year long	Semester 1	Semester 2	Summer
Core	n/a	60 credits	30 credits	60 credits
Optional	n/a	n/a	30 credits	

180 credits in total

Core modules

Delivery period	Code	Title	Credits
Semester 1	GY7414	Introduction to Environmental Modelling	15 credits
Semester 1	MA7441	Overview of Data Science Practice	15 credits
Semester 1	MA7023	Statistics for Data Science	15 credits
Semester 1	MA7419	Fundamentals of Data Science	15 credits
Semester 2	GY7718	Applications of Environmental Modelling	15 credits
Semester 2	GY7714	Research for Change	15 credits

Delivery period	Code	Title	Credits
Summer	GY7720	Dissertation	60 credits

Notes
n/a

Option modules

Delivery period	Code	Title	Credits
Semester 2	GY7707	Geospatial Data Analytics	15 credits
Semester 2	GY7708	Geographical Artificial Intelligence	15 credits
Semester 2	GY7711	Field Data Capture	15 credits
Semester 2	GY7413	Information Visualisation	15 credits
Semester 2	MA7442	Modelling Data	15 credits

Notes
This is an indicative list of option modules and not definitive of what will be available. Option module choice is also subject to availability, timetabling, student number restrictions and, where appropriate, students having taken appropriate pre-requisite modules.

MSc in Environmental Data Science with Industry

Level 7/Year 1 Delivery Year 2026/27 Intake Month September Mode of Study Full Time Structure

Year 1

Programme structure is as for the full-time taught component of the non-industry degree.

Year 2

Core Modules

Delivery period	Code	Title	Credits

Semester 1	ADGY7223	On Placement	n/a
Semester 2	ADGY7223	On Placement	n/a
Summer	GY7720	Dissertation	60

Appendix 2: Module specifications

See postgraduate module specification database (Note - modules are organized by year of delivery) [login-required]