Programme Specification (Postgraduate) FOR ENTRY YEAR: 2025/26

Date created: 14/05/25 **Last amended:** Click or tap to enter a date. **Version no.** 1 **Date approved by EQED:** Click or tap here to enter text.

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

MSc Data Science (Geospatial)

MSc Data Science (Geospatial) with Industry

PG Dip Data Science Studies (Geospatial)

PG Cert Data Science Studies (Geospatial) *

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	%
100369	30%
100370	50%
100956	10%
100992	10%

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

3. a) Mode of study Full-time

b) Type of study Campus-based

4. Registration periods:

MSc Data Science (Geospatial)

- The normal period of registration is 12 months (full time).
- The maximum period of registration is 24 months (full time)

PG Dip in Data Science Studies (Geospatial)

- The normal period of registration is 9 months (full time).
- The maximum period of registration is 18 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 18-24 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.

6. Accreditation of Prior Learning

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

7. Programme aims

The interdisciplinary MSc in Data Science (Geospatial) trains students in Data Science with an emphasis on using the unique characteristics of spatial data (location, distance and spatial interactions) to understand where, when and why things happen. Using a wide range of data types and sources, students are taught how to leverage geospatial data using specialised methods and software to better understand the place-based contexts of social, economic and environmental phenomena. The uptake, use, and commercialisation of geospatial data increasingly requires expertise in Data Science and students will be trained in a broad range of data science techniques, including machine learning. These skills are not limited to a career focused on geospatial data analyses. They address the shortage of qualified data scientists in the UK and abroad and successful students will be 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 gain insight and understanding from geospatial data analyses.

The 'with 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 Data Science (Geospatial)

a) Discipline specific knowledge and competencies

i) Knowledge

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: describe and illustrate the range and availability of geospatial data and their breadth of application in a variety of social, economic and environmental contexts;	Lectures; Practical classes/workshops; Tutorials; Seminars; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	Report; Essay; MCQ test
explain, demonstrate and evaluate the key principles and practices of geospatial analysis;	Lectures; Seminars; Practical classes/workshops; Tutorials; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	Report; Essay; MCQ test
describe what is meant by data science, its key principles and practices;	Lectures; Seminars; Practical classes/workshops; Guided independent study	Practical exercise; Discussion; Formative assessment; Online research; Guided reading	Report; Exam; Project
apply techniques of data science to applications of data analyses including geospatial analyses.	Lectures; Seminars; Practical classes/workshops; Guided independent study	Practical exercise; Discussion; Problem-based learning; Guided reading	Report; Essay; Exam

ii) Concepts

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: describe the foundational concepts associated with geospatial data, data types and geospatial data analyses;	Lectures; Tutorials; Practical classes/workshops; Seminars; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	Report; Essay; MCQ test
discuss the importance of spatial analysis design choices and spatial data relationships in the analysis of geospatial processes and phenomena.	Lectures; Tutorials; Practical classes/workshops; Seminars; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	Report; Essay; MCQ test

iii) Techniques

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: plan and build scripts using open-source programming languages to process a range of data types including geospatial data.	Lectures; Seminars; Practical classes/workshops; Tutorials; Guided independent study	Practical exercise; Discussion; Problem-based learning; Formative assessment; Online research; Literature search; Guided reading	Project; Exam; Report; MCQ test; Essay
differentiate between, use and manipulate different types of spatial data encodings and formats.	Lectures; Tutorials; Practical classes/workshops; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	Report; MCQ test
explain and use modelling and machine learning approaches to analyse a range of data types including geospatial data.	Lectures; Seminars; Practical classes/workshops; Guided independent study	Practical exercise; Discussion; Problem-based learning; Formative assessment; Online research; Guided reading	Project; Exam; Essay; Report

deploy specialised data wrangling techniques, statistical methods, machine learning algorithms and visualisation techniques tailored to handle and gain insight from spatial data.	Lectures; Seminars; Practical classes/workshops; Guided independent study	Practical exercise; Discussion; Problem-based learning; Formative assessment; Online research; Guided reading	Project; Exam; Essay; Report

iv) Critical Analysis

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: analyse and interpret a range of data types including geospatial data to make critical contributions to key social, economic and environmental debates;	Lectures; Tutorials; Practical classes/workshops; Project supervision; Seminars; Guided independent study	Practical exercise; Discussion; Problem-based learning; Formative assessment; Online research; Guided reading	Dissertation; Research proposal; Exam; Report; Essay
describe and evaluate the challenges, biases and limitations specific to geospatial data and methods.	Lectures; Tutorials; Seminars; Practical classes/workshops; Project supervision; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	Report; MCQ test; Essay; Dissertation; Research proposal

v) Presentation

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: present a range of data including geospatial data and data products in a variety of formats and to a variety of audiences.	Lectures; Seminars; Practical classes/workshops; Tutorials; Seminars; Project supervision; Guided independent study	Practical exercise; Discussion; Problem-based learning; Formative assessment; Online research; Literature search; Guided reading	Project; Exam; Report; MCQ test; Essay; Dissertation; Research proposal; Dissertation presentation

vi) Appraisal of evidence

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: critically appraise a range of data types including geospatial data and data products in problem solving contexts.	Lectures; Seminars; Practical classes/workshops; Tutorials; Project supervision; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	MCQ test; Report; Essay; Dissertation; Research proposal

b) Transferable Skills

i) Research Skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: conduct Literature search;	Lectures; Tutorials; Practical classes /workshops; Project supervision; Guided independent study	Discussion; Workshop; Project supervision; Guided reading	Research proposal; Dissertation
read, analyse and reflect critically on scientific texts and other source materials;	Lectures; Tutorials; Practical classes /workshops; Project supervision; Guided independent study	Discussion; Workshop; Project supervision; Guided reading	Research proposal; Dissertation
design, execute, and write-up a piece research within a specific physical or socio-economic context that is bounded by concepts of data science and utilizes appropriate geospatial data or data products.	Lectures; Tutorials; Practical classes /workshops; Project supervision; Guided independent study	Discussion; Workshop; Project supervision; Guided reading	Research proposal; Dissertation

ii) Communication skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: communicate effectively in a variety of formats.	Lectures; Seminars; Practical classes/workshops; Guided independent study	Practical exercise; Discussion; Problem-based learning; Formative assessment; Online research; Guided reading	Exam; Report; Essay

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 exercise; Discussion; 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 exercise; Discussion; Project supervision; 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 geospatial and other types of data.	Lectures; Practical classes/workshops; Seminars; Guided independent study	Practical exercise; Discussion; Problem-based learning; Formative assessment; Online research; Guided reading	Project; Report; Exam; Essay

v) Problem Solving

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: analyse geospatial data within problem solving contexts;	Lectures; Practical classes/workshops; Seminars; Tutorials; Project supervision; Guided independent study	Practical exercise; Discussion; Problem-based learning; Literature search; Guided reading	Report; MCQ test; Essay; Dissertation; Research proposal
explore key problem spaces with contemporary discourses and approaches.	Lectures; Practical classes/workshops; Seminars; Tutorials; Project supervision; Guided independent study	Practical exercise; Discussion; Problem-based learning; Guided reading	Report; Essay; Concept map; Dissertation; Research proposal

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; Seminars; Tutorials; Project supervision; Guided independent study	Practical exercise; Discussion; Problem-based learning; Guided reading	Essay; Report; Research proposal; Dissertation

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 workshop.	Online quizzes (Formative assessment)
describe and reflect upon the role of Data Science and the Geospatial Data Scientist in contributing to and delivering collaborative environmental projects in a range of interdisciplinary management and policy-setting contexts.	Lectures; Seminars; Practical classes/workshops; Guided independent study	Practical exercise; Discussion; Formative assessment; Online research; Guided reading	Report; Exam; Concept map

For the 'withIndustry' variant, 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.

In cases where a student has failed to meet a requirement to progress he or she will be required to withdraw from the course.

a) Course transfers

n/a

b) Year in Industry

For the with Industry variant additional progression points apply.

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 a specific (Geospatial) disciplinary context

For the with 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
	The programme aims to give practical knowledge of the concepts and techniques making up the area of practice known as data science, and their relationship to other areas of practice involving the collection and analysis of data. Spatial analyses, including the use of Geographic Information Systems (GIS) and artificial intelligence are given particular emphasis. The curriculum ensures that the knowledge and skills you gain are applicable across a range of professional data science 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 will benefit from the strong research background of the University of Leicester's School of Geography, Geology & Environment, 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. Throughout the programme, staff emphasise how Data Science methodologies and

	techniques can be used to ensure that your conclusions are reliable, reproduceable, and free from bias.
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. 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 will 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. You will be able to search information effectively, and demonstrate advanced analytical skills to interpret data and other collected information into a clear and substantial report. Practical work emphasises the importance of transparency and replicability in data science.
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 using on independent research, supported by an expert supervisor.

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.

The School of Computer and Mathematical Sciences organises a series of talks for students in Data Science which are delivered by internal and external speakers. Some of the external speakers invited include a speaker from Space Park Leicester, and a speaker from an actuarial consulting firm who talks about the use of data in actuarial sciences. Topics covered by the internal speakers, include the use of data in healthcare, and in the museum data service.

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:

Our teaching of geospatial data analyses draws on the body of learning and teaching research carried out during the Leicester-led HEFCE Spatial Literacy in Learning and Teaching project.

More generally, both Schools support 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.

In GGE, 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.

In CMS, all module convenors are part of teaching pods, which group similar fields together. These pods are designed to provide a forum for discussion between teaching-focussed and teaching/research staff, and as a way for more experienced staff to support others by, for example, peer observation and feedback. This provides a platform for staff to share considerations and observations of their teaching experience and obtain research-based input.

13. Indications of programme quality

External examiners reports

For the with 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.

Data Science (Geospatial)

Level 7/Year 1 Delivery Year 2025/26 Intake Month September Mode of Study Full Time Structure

Credit breakdown

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

180 credits in total

Core modules

Delivery period	Code	Title	Credits
Semester 1	GY7701	Fundamentals of GIS	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	GY7708	Geospatial Artificial Intelligence	15 credits
Semester 2	CO7441	Creative Problem Solving	15 credits

Delivery period	Code	Title	Credits
Semester 2	MA7442	Modelling Data	15 credits
Semester 2	GY7413	Information Visualisation	15 credits
Summer	GY7720	Dissertation	60 credits

Notes
n/a

MSc in Data Science (Geospatial) with Industry

Level 7/Year 1 Delivery Year 2025/26 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
Summer	GY7720	Dissertation	60

Appendix 2: Module specifications

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