Programme Specification (Postgraduate)

FOR ENTRY YEAR: 2025/26

Date created: 07/08/2023 **Last amended:** 13/01/2025 **Version no.** 1 **Date approved by EQED:**
Click or tap here to enter text.

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

MSc/PG Diploma/PG Certificate* in Data Science
* Exit award only
MSc in Data Science with Industry

a) HECOS Code

HECOS Code	%
100370	100

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

The normal period of registration is 1 year.

The maximum period of registration 2 years.

PGDip Data Science

The normal period of registration is 1 year.

The maximum period of registration 2 years.

MSc Data Science with Industry

The normal period of registration is 2 years.

The maximum period of registration is 3 years.

5. Typical entry requirements

2:1 Honours degree or international equivalent in any subject.

No requirement for mathematics or programming background, but a demonstrable interest in developing statistical and programming skills shown in the personal statement or CV if there is no relevant academic qualification

6. Accreditation of Prior Learning

n/a

7. Programme aims

Subject knowledge, understanding and skills

The programme will give you 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.

Intellectual and analytical skills
You will also develop the skills to critically analyse your work, and that of others, in particular in relation to the appraisal of data sources and the ethical issues arising from data collection and algorithmic decision making.

Statistical and modelling skills

You will be able to formulate a data science problem mathematically, obtain solutions by appropriate modelling methods, and draw valid inferences.

Computational problem-solving & practical computing skills
You will learn to use software tools to apply scientific techniques for the exploration, modelling and visualisation of data by solving real-world problems.

Research and project planning skills
A characteristic of data science is its multidisciplinary and collaborative style of working. You will work in a group to plan and conduct an advanced project in data science, recognising that complex problems require consideration from different viewpoints for an effective solution.

Professional skills
Recognising the importance of presentation skills and impactful visualisation of results in influencing decision makers, you will learn concepts and techniques of data visualisation and use them when exploring different approaches to presenting your work.

With Industry variant
This is offered in accordance with the University standard model – details are available through the link provided below:

https://le.ac.uk/study/postgraduates/courses/industry-2025-26

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).

a) Discipline specific knowledge and competencies

i) Knowledge

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: explain what is meant by data science and its relationship to other areas involving collection and analysis of data	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects
Students should be able to: assess the role of data science in addressing the challenges of climate change and promoting sustainability	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

ii) Concepts

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: explain the purposes and limitations of modelling data (including ethical and EDI issues)	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

Students should be able to: recognise the importance of presentation skills and impactful visualisation	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects
Students should be able to: explain and discuss fundamental concepts related to visual perception and representation	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

iii) Techniques

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: plan and build simple program scripts to read data from various sources and formats, and undertake data cleaning and manipulation in a reproducible way	Lectures, online learning material practical classes	Group problem-based learning, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects
Students should be able to: apply basic statistical techniques and use the key data structures used in data science to draw reliable inferences from data	Lectures, online learning material practical classes	Group problem-based learning, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects
Students should be able to: implement examples from each of the main categories of data model in a high-level programming language	Lectures, online learning material practical classes	Group problem-based learning, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

iv) Critical Analysis

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Demonstrate skills in critically reflecting on the applications and implications of data analysis and visualisation tools at each stage of the data science workflow	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects
Students should be able to: Constructively critique the work of oneself and others at each stage of the data science workflow	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects

v) Presentation

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: use software tools or scripting languages to create effective visualizations	Lectures, online learning material practical classes	Group problem-based learning, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

vi) Appraisal of evidence

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type

Students should be able to: identify important sources of data and critically evaluate them	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects
Students should be able to: explain the various kinds of risk in data science, including ethical risks, for example, those arising from historical biases due to race and gender; identify the risks in particular case studies; and discuss how to handle them	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects

b) Transferable Skills

i) Research Skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: use library sources and online materials to supplement recommended texts and sources to explore syllabus components	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects
Students should be able to: demonstrate advanced analytical skills to interpret data and other collected information into a clear and substantial report	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects

ii) Communication skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: communicate in a way that is appropriate to the intended audience and business or research context	Lectures, online learning material and group discussions	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects

iii) Data Presentation

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Present data in a way that is appropriate to the intended audience and business or research context	Lectures, online learning material practical classes	Group problem-based learning, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

iv) Information Technology

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: identify and use appropriate software tools	Lectures, online learning material practical classes	Group problem-based learning, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

v) Problem Solving

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: analyse problems to identify the role of data science in formulating a solution map the stages of problem solving onto a data science workflow	Lectures, online learning material practical classes	Group problem-based learning, independent reading and research, marked and self-assessed assignments	Written examinations, reports and presentations on problem-based projects

vi) Working relationships

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: work in a group to plan and conduct an advanced project in data science, recognising that complex problems require consideration from different viewpoints for an effective solution	Lectures, online learning material practical classes	Group problem-based learning	reports and presentations on problem-based group projects

vii) Managing learning

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: work independently and make effective use of resources in guided independent study	Lectures, online learning material, group discussions and project supervision	Group discussion, independent reading and research, marked and self-assessed assignments, maintenance of a reflective learning journal	Written examinations, reports and presentations on problem-based projects including final research project

viii) Career Management

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Understand the role of data science in a range of business, research and other application areas and identify the skills required by data scientists to contribute effectively in these areas	Lectures, online learning material, group discussions and project supervision	Group discussion, independent reading and research	Reports and presentations on problem-based projects including final research project

With Industry variant
This is offered in accordance with the University standard model – details are available through the link provided below:

https://le.ac.uk/study/postgraduates/courses/industry-2025-26

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.

The following module has restrictions on the assessment components that can be reassessed:

- MA7443

Please refer to the module specification for full details.

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) With Industry variant

This is offered in accordance with the University standard model – details are available through the link provided below:

https://le.ac.uk/study/postgraduates/courses/industry-2025-26

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

This programme is designed to be accessible to students from a wide range (including non-STEM) of previous academic experience.

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
Research-briefed Bringing staff research content	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. A characteristic of data science is its multidisciplinary, collaborative style of working; therefore, students will work in groups to plan and conduct advanced projects in data science. Research-briefed: Students will develop an awareness of the methodologies and fundamental techniques that are used in data science. Throughout the modules, staff emphasise the importance of the use of these fundamental techniques to

into the curriculum. **Research-based** Framed enquiry for exploring existing knowledge. **Research-oriented** Students critique published research content and process. **Research-apprenticed** Experiencing the research process and methods; building new knowledge.	ensure that the students' future research conclusions are reliable, reproduceable, and free from bias. Research-based: During practical classes, students will learn to use software tools to apply scientific techniques for the exploration, modelling and visualisation of data by solving real-world problems. Research-oriented: Students 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. They will also develop the skills to critically analyse their own work, and that of others, in particular in relation to the appraisal of data sources and the ethical issues arising from data collection and algorithmic decision making. Practical work emphasises the importance of transparency and replicability in data science projects. Research-apprenticed: Students will work in a group to plan and conduct an advanced project in data science, recognising that complex problems require consideration from diverse viewpoints for an effective, unbiased solution.

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 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:

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.

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.

Teaching staff meet once a year for a 'Teaching Away Day', which gives the opportunity to discuss some key issues in depth with the other members within the teaching pods, and shared with everyone. This gives a chance to share ideas and experience, and to identify questions that need answers.
Additionally, staff will be paired within their teaching pods to observe each other's teaching sessions then meet to agree actions in order to participate in UoL's Peer Observation of Teaching scheme.

13. Indications of programme quality

QAA subject review [www/qaa.org/], external examiners reports ("the performance of the students is comparable with similar high-quality UK institutions"), QAA benchmark descriptors for a master's degree, taken from the benchmark statements for Computing (2022, pp.24-26) and Mathematics, Statistics and Operational Research (2023, p.29) where relevant.

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.

MSc Data Science

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

Credit breakdown

Status	Summer Term	Semester 1	Semester 2
Core	60 credits	45 credits	45 credits
Optional	n/a	15 credits	15 credits

180 credits in total

Core modules

Delivery period	Code	Title	Credits
Semester 1	MA7441	Overview of Data Science Practice	15 credits
Semester 1	MA7419	Fundamentals of Data Science	15 credits
Semester 1	MA7023	Statistics for Data Science	15 credits
Semester 2	MA7442	Modelling Data	15 credits
Semester 2	GY7413	Information Visualisation	15 credits
Semester 2	CO7441	Creative Problem Solving	15 credits

Delivery period	Code	Title	Credits
Summer Term	MA7443	Data Science Research Project	60 credits

Notes
n/a

Option modules

Delivery period	Code	Title	Credits
Semester 1	MA7444	Excel for Data Science	15 credits
Semester 1	PA7081	Practical Programming	15 credits
Semester 2	MA7202	Introduction to Functional Data Analysis	15 credits
Semester 2	MK7406	International Business	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.

Students on a 'with industry' degree will take MA7443 Data Science Research Project after their industry placement is complete.

Appendix 2: Module specifications

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