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

Date created: 20/01/23 **Last amended:** 20/01/2025 **Version no.** 1 **Date approved by EQED:** Click or tap here to enter text.

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

MSc in Population Health Data Science
Postgraduate Diploma in Population Health Data Science *
Postgraduate Certificate in Population Health Data Science *

* These awards are only available as exit awards, and are not available for students to register onto.

a) HECOS Code

HECOS Code	%
101031 Medical Statistics	50
100994 Health Informatics	50

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

3. a) Mode of study Part-time and Full-time

b) Type of study Campus-based

4. Registration periods:

The normal period of registration for the MSc is 12 months full-time/27 months part-time
The maximum period of registration for the MSc is 24 months full-time/48 months part-time

5. Typical entry requirements

Candidates should have at least a 2:2 honours degree or equivalent in a subject with a substantial quantitative element such as mathematics, physics, economics. Other degrees will be considered on an individual basis. Where English is not a candidate's first language, applicants will be required to provide evidence of appropriate skills in line with the requirements of Senate Regulation 1, with a requirement of the equivalent to an overall IELTS score of 6.5, with a minimum score of 6 in every element.

6. Accreditation of Prior Learning

Accredited prior learning will not be accepted for exemptions from modules on this programme.

7. Programme aims

This advanced programme will offer an opportunity to get a qualification in an exciting topic that is at the forefront of research attempting to answer the big health questions and challenges faced in the UK and globally, with the direct aim of improving health. We will be developing a new generation of Health Data Scientists equipped with key computational, analytical and professional/employability skills to work in the broad health sciences domain, in both academia and industry. The graduates will have a through grounding in the computational skills required to manage and maintain big health datasets, advanced methods for analysing health data, and critical thinking, problem-solving and professional skills, through exposure to real-world health data science problems.

This postgraduate degree will provide the expertise needed to become a practising health data scientist. Students will develop expertise in the computational requirements needed to handle and

query big health data sets, and the advanced statistical methods underpinning modern day data science, but with a focus on understanding, applying and adapting it to real-life problems in the health domain. Analytical skills will be developed on real medical data sets, using statistical and computational software such as R and Python. Students will develop knowledge base of cutting-edge machine learning and artificial intelligence methods, learning how they can be harnessed to answer clinical questions, bringing together the power and potential of computational analytics, statistical thinking, and medical research, to improve health.

An important factor in the success of a practising health data scientist is the ability to communicate with others. To develop these skills, students will work on two mini-projects and will develop a wide range of professional skills throughout the course. The mini-projects involve managing, exploring, and analysing data arising from real problems and data sets and reporting on the findings.

8. Reference points used to inform the programme specification

- Royal Statistical Society Accreditation and Quality Mark Guidelines
- QAA Characteristics Statement: Master's Degree Feb 2020
- Framework for Higher Education Qualifications (FHEQ)
- UK Quality Code for Higher Education
- University of Leicester Education Strategy
- University of Leicester Assessment Strategy
- 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: Demonstrate comprehensive knowledge required at the forefront of the health data science discipline: including the core statistical methodology; the most commonly used designs of studies to collect medical/health data and available data sources; the management and manipulation of such data; exploration and modelling of the data to answer specific medical/health questions.	Lectures, problem solving class reviews. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, group activities.	Coursework (problem-based questions, data manipulation, analysis and report writing), mini-projects, online examination, group poster design and presentation. Formative activities such as group work, oral presentations and computer lab reviews. Project (MSc only)

ii) Concepts

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Demonstrate an in-depth understanding of the role of data science in medical/health research.	Lectures, problem solving class reviews. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework (problem-based questions, data manipulation, analysis and report writing), mini-projects, online examination, group poster design and presentation. Formative activities such as group work, oral presentations and computer lab reviews.

			Project (MSc only)

iii) Techniques

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Effectively apply methods to manage complex data considering security and ethical issues and use statistical and machine learning methods to answer medical/health questions.	Lectures, problem solving class reviews. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations and computer lab reviews. Project (MSc only).

iv) Critical Analysis

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Interpret and critically appraise the use and findings of statistical and machine learning methods, discuss the strengths and limitations, and make recommendations for further work.	Lectures, problem solving class reviews. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, examination, formative activities such as group work, oral presentations. Project (MSc only).

v) Presentation

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Confidently and professionally communicate the results and findings through written reports and oral presentations.	Lectures, problem solving class reviews. Study skills sessions on report writing and oral presentations. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).

Participate in discussion of the use and interpretation of data.			

vi) Appraisal of evidence

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Demonstrate a high level of competency in critically evaluating the quality of data and analyses related to medicine/health, both their own and current analyses published in the medical literature.	Lectures, problem solving class reviews. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, examination, formative activities such as group work, oral presentations and computer lab reviews. Project (MSc only).

b) Transferable Skills

i) Research Skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Perform a review of relevant literature, demonstrate knowledge of the source of data, conduct appropriate analyses, critique the findings.	Lectures, problem solving class reviews, study skills sessions on library skills. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).

ii) Communication skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Write a scientific report on the findings for a health data science problem. Deliver a professional oral presentation. Participate in a scientific discussion on health data science issues.	Study skills sessions on report writing, lectures, consultancy skills and group work, problem solving class reviews. Project supervision (MSc only)	Problem solving classes, directed and self-directed reading, individual and group-work with presentations	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).

iii) Data Presentation

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Effectively use statistical and Office software to present a clear summary of a data set and the findings of a statistical analysis.	Lectures, problem solving class reviews. Study skills session on report writing. Project supervision (MSc only)	Problem solving classes, directed and self-directed reading, individual and group-work with presentations	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).

iv) Information Technology

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Conduct a literature search of publication databases and use bibliographic software.	Library skills session and online resources. Project supervision (MSc only)	Directed and self-directed searching, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).
Students should be able to: Effectively use software to produce professional quality reports and presentations.	Lectures, resource-based learning on Blackboard, directed and self-directed reading. Project supervision (MSc only)	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).
Students should be able to: Use a range of computing and statistical software packages for data handling and advanced statistical analysis.	Lectures, problem solving class reviews, directed and self-directed reading. Project supervision (MSc only)	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).

v) Problem Solving

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Identify, conduct and interpret the most appropriate methods of data collection, management and analysis to answer complex medical/health questions. Show originality in the approach to problem solving.	Lectures, problem solving classes, directed and self-directed reading. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations. Project (MSc only).

vi) Working relationships

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Work effectively in a team and communicate findings to colleagues and other health professionals.	Group-work and consultancy skills sessions	Problem solving classes, group-work.	Formative activities such as group work, oral presentations. Summative group work and presentation.
Demonstrate the ability to plan and work effectively on an independent project under supervision (MSc only).	Project supervision (MSc only).	Project supervision (MSc only)	Project presentation and report

vii) Managing learning

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Demonstrate time-management skills through organisation of the workload and deadlines.	Problem solving classes, directed and self-directed reading. Project supervision (MSc only).	Problem solving classes, directed and self-directed reading, individual and group-work.	Coursework, mini-projects, formative activities such as group work, oral presentations and computer lab reviews. Project (MSc only).

viii) Career Management

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Identify the opportunities (jobs and PhDs) available to graduates and effectively demonstrate knowledge of the skills required to be a practising health data scientist through job/PhD applications and interviews.	Lectures, subject specific careers sessions organised within the course and externally. Study skills sessions on applying for jobs, writing a CV and covering letter and consultancy skills,	Blackboard folder on skills including interview skills. Personal tutor meetings. Guest lectures and seminars from potential employers.	Coursework, mini-projects, formative activities such as group work, oral presentations
Students should be able to: Professionally present own project research to peers and supervisors.	Project introduction seminar Project supervision (MSc only).	Project presentation and report	Coursework, mini-projects, formative activities such as group work, oral presentations and computer lab reviews. Project (MSc only).

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 they will be required to withdraw from the course and a recommendation will be made to the Board of Examiners for an intermediate award where appropriate.

a) Course transfers

n/a

b) Year in Industry

n/a

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 is an advanced programme providing students with good core skills in medical statistics and machine learning, an appreciation of where data comes from and issues in the handling and analysis of complex health data, and the computing skills required to manage the data. Staff from the Department of Population Health Sciences are research active in health data science and experts from within and outside the university are invited to speak on more specialized topics.

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 provides a thorough grounding in the methods underlying health data science, and also critical thinking and problem-solving skills through exposure to real-world/authentic health data science problems. It draws on international medical research ensuring that the knowledge and skills our graduates acquire through the programme will have applications across the world.
Research-briefed Bringing staff research content into the curriculum.	Research-briefed - The students will be exposed to challenging learning, inspired and informed by cutting-edge research, by drawing on the internationally renowned research of the Biostatistics and Genetic Epidemiology research groups in Population Health Sciences as well as other experts at the University of Leicester. All staff teaching on the programme are engaged in research and bring their experiences into their teaching.
Research-based Framed enquiry for exploring	Research-based - Lectures, classroom practicals and assessments are based on real world medical research problems and data, putting the data management, statistical methods and modelling into context.

existing knowledge. **Research-oriented** Students critique published research content and process. **Research-apprenticed** Experiencing the research process and methods; building new knowledge.	Research-oriented – Students are required to critically appraise their own data management, analyses and findings in both seminars and assessment. They are given guidance and training in how to critically appraise published research. Research-apprenticed – Training and practice will be provided on report writing, group work, presentation skills, reading research papers, library skills including searching and reference manager software. Students will work individually and in groups to present their findings from their data management, analyses and critical appraisals, via individual written reports, oral group presentations and a group poster. During their individual 12-week research projects, students will work, under supervision of academic member of staff, on a project that reflects a real health data science issue in medical research. They will present their initial aims and planned work to their peer group and project supervisors and then present their findings in a formal report.

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:

Students will have access to Departmental seminars covering a range of topics across disciplines in health research, delivered by internal researchers and academic staff and also external speakers. They will be encouraged to attend wider university seminars in the area of health data science. They will have access to PhD students and researchers who will support them in career decisions. Career sessions are delivered by PhD students and graduates who describe their career pathways in working as a health data scientist in health research.

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 team meetings enable staff to share good practice, discuss teaching approaches and disseminate innovative practice. Most staff teach across a range of UG and PGT programmes and hence have a wide breadth of experience but are continually looking for new and innovative ways to inform the teaching and assessment.
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.

13. Indications of programme quality

External Examiners' reports, destination survey.

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.

Updates to the programme

Academic year	Module	Change
2026/27 (part-time structure)	MD7474 Epidemiology for Health Data Science	Replaces MD7452 Epidemiology

MSc in Population Health Data Science

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

Credit breakdown

Status	Year long	Autumn Term	Spring Term	Summer – Jun-Sept
Core	45 credits	30 credits	30 credits	75 credits
Optional	n/a	n/a	n/a	

180 credits in total

Core modules

Delivery period	Code	Title	Credits
Autumn Term	MD7440	Fundamentals of Medical Statistics	15 credits
Year long	MD7442	Statistical Modelling	15 credits

Delivery period	Code	Title	Credits
Year long	MD7475	Foundations of Health Data Science	15 credits
Autumn Term	MD7453	Statistical Computing and Inference	15 credits
Year long	MD7443	Computationally Intensive Methods	15 credits
Spring Term	MD7474	Epidemiology for Health Data Science	15 credits
Spring Term	MD7444	Advanced Statistical Modelling	15 credits
Summer Term	MD7476	Further Topics in Health Data Science	15 credits
Summer Term	MD7477	Health Data Science Project	60 credits

Notes

Modules are taught in week blocks; some modules have two weeks of teaching with an assessment week and others have one week of teaching and a two week assessment

Level 7/Years 1 and 2 Delivery Year 2025/26 and 2026/27 Intake Month October Mode of Study Part Time Structure

Credit breakdown

Status	Year long	Year 1	Year 2	Summer and Autumn Terms
Core	n/a	45 credits	75 credits	60 credit project
Optional	n/a	n/a	n/a	n/a

180 credits in total

Core modules

Delivery period	Code	Title	Credits
Year 1			
Autumn Term	MD7440	Fundamentals of Medical Statistics	15 credits
Year long	MD7467	Statistical Modelling	15 credits

Delivery period	Code	Title	Credits
Year long	MD7475	Foundations of Health Data Science	15 credits
Year 2			
Autumn Term	MD7453	Statistical Computing and Inference*	15 credits
Year long	MD7443	Computationally Intensive Methods	15 credits
Spring Term	MD7474	Epidemiology for Health Data Science	15 credits
Spring Term	MD7468	Advanced Statistical Modelling	15 credits
Summer Term	MD7476	Further Topics in Health Data Science*	15 credits
Year 2/3			
Choose an item.	MD7477	Health Data Science Project*	60 credits

Notes

Modules are taught in week blocks, some modules have two weeks of teaching with an assessment week and others have one week of teaching and a two-week assessment.

*The Statistical Computing element of MD7453 will be delivered and assessed in year 1 and the first teaching week of MD7476 will be delivered and assessed in year 1.

The Health Data Science project will take place over the summer term in year 2 and the autumn term in year 3

Appendix 2: Module specifications

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