Programme Specification (Postgraduate)

FOR ENTRY YEAR: 2024/25

Date created: 05/12/2023 **Last amended:** 25/04/2024 **Version no.** 1

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

MSc Data Analysis for Business Intelligence with Industry

HECOS Code

2. Awarding body or institution

University of Leicester

3. a) Mode of study

Full-time

b) Type of study

Campus-based

4. Registration periods

The normal period of registration for the MSc is 24 months.

The maximum period of registration for the MSc is 36 months.

5. Typical entry requirements

2:2 UG degree in Mathematics or other numerate subject such as Physics from a British university or equivalent international level as defined under regulations. Applicants from a computer science background would be considered on a case by case basis through the assessment of the student transcript. Applicants with non-standard first degrees and/or significant work experience will again be assessed on a case by case basis, taking the nature and currency of their work experience into account. This will be done through personal interviews of such applicants, taken by the programme director.

Standard College English language requirements, in line with Senate Regulation 1.

6. Accreditation of Prior Learning

N/A

7. Programme aims

The programme aims to provide a route for students in their transition from undergraduate study to employment in data-led sectors. It provides the opportunity to gain practical experience in databases (and achieve two professionally accredited certificates) and a rigorous understanding of applied statistics, data mining, operational research and related areas.

In particular it aims to

- foster confidence, convey knowledge and develop expertise in data analysis and handling;
- provide an advanced education in the fundamental mathematical concepts and techniques relevant to data analysis;
- develop the ability to produce rigorous justifications of assertions by logical arguments;
- enhance the ability to model the world using mathematical models, and to be able to produce innovative, cost-effective, and robust solutions to real-world problems;

- enhance the ability to infer valid conclusions from raw data;
- stimulate intellectual development and hone powers of critical analysis, problem solving, written communication skills and improve presentational skills;
- develop the ability to communicate solutions to problems using language appropriate to any target audience;
- develop project-management skills;
- enhance practical computing skills in software relevant to industry;
- raise students' expertise and understanding to a point where they could embark upon doctoral interdisciplinary study or enter data-led industrial sectors;
- raise students' ability to complete independent project work and foster the skill of developing innovative tools (MSc only).

8. Reference points used to inform the programme specification

- QAA Framework for Higher Education Qualifications in England, Wales and Northern Ireland
- QAA Master's Degree Characteristics
- QAA Benchmarking Statement Mathematics, Statistics and Operational Research (MMath)
- QAA Annex to subject benchmark statement: Mathematics, statistics and operational research (2009)
- University Education Strategy
- University Assessment Strategy [log in required]
- University Employability Strategy
- Graduate Survey
- First Destination Survey
- External Examiner's Reports
- Informal concept document used to aid discussion with partner departments

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 Outcomes	Teaching and Learning Methods	How Demonstrated?
Advanced knowledge of fundamental theories and techniques.	Lectures. Specified reading. Problem classes.	Written examinations, assessed coursework, project.
Knowledge and understanding of key techniques and algorithms in data analysis. Ability to modify and innovate.	As above.	As above
Familiarization with common industrial applications of data modelling and commonly used techniques.	As above.	As above
Knowledge of relevant computing languages and relevant software.	Lectures. Practical sessions. Project.	As above

ii) Concepts

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Rigorous understanding of relevant methods.	Lectures. Specified reading. Problem classes.	Written examinations, assessed coursework, project.
Practical understanding of implementations.	Lectures. Specified reading. Problem classes. Project.	As above.

iii) Techniques

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Ability to code algorithms in a range of commonly used languages.	Practical sessions. Project.	Assessed coursework, project.
Ability to develop and apply strategies to solve problems.	As above.	As above.
Ability to use commonly used commercial software.	As above.	As above.

iv) Critical analysis

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Analysis of problem and development of appropriate solution strategy. Analyse and solve `messily defined' industrial problems.	Lectures. Problem classes. Feedback on assessed problems. Project.	Written examinations, assessed coursework, project.

v) Presentation

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Presentation of concepts, algorithms and solutions.	Practical sessions. Tutorials. Project.	Assessed coursework, project.

vi) Appraisal of evidence

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Critical appraisal of algorithms and solutions.	Course work. Project.	Written examinations, assessed coursework, project.

b) Transferable skills

i) Research skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Conduct background research and literature surveys.	Course work. Project.	Assessed coursework. Project.
Summarize content from information sources.	As above.	As above.

ii) Communication skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Response to questioning.	Practical sessions. Tutorials. Project.	Assessed coursework. Project.
Scientific communication (written and oral).	As above.	As above.
Project presentation (written and oral.)	As above.	As above.

iii) Data presentation

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Project presentation (written and oral.)	Practical sessions. Tutorials. Project.	Assessed coursework, project.

iv) Information technology

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Various computer languages (FORTRAN, C, C++) and specialist software (FLUENT).	Throughout.	Assessed coursework, project.
Office software.	Coursework. Project.	As above.

v) Problem solving

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Analysis, breakdown, synthesis, critical examination.	Practical sessions. Tutorials. Project.	Written examinations, assessed coursework, project.
Computational modelling skills.	Coursework. Project.	Assessed coursework, project.

vi) Working relationships

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Scientific discussion.	Practical sessions. Tutorials. Project.	Project.

vii) Managing learning

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Study skills.	Throughout.	Written examinations, assessed coursework, project.
Independence and time management.	Structured support decreasing through year. Project.	Meeting deadlines.
Information retrieval.	Coursework. Project.	Assessed coursework, project.

viii) Career management

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Scientific discussion.	Practical sessions. Tutorials. Project (MSc only).	Project.

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Organisation. Time management.	Structured support decreasing through year. Project.	Meeting deadlines.
Careers and business awareness.	Careers workshops. Industry- led project. Guest speakers.	Destination data. Student feedback.

10. Special features

- Interdisciplinary programme using expertise from across the College.
- Industry-linked dissertations.

Placements

Students registered on the 'with Industry' variant of their degree programme undertake an industrial placement after completing the taught modules of their programme and before undertaking the final project/dissertation. The placement must be 12 months in duration.

Students are responsible for securing their own placement but will receive support in this from the Career Development Service.

Progression criteria for placements

Students on the "with Industry" programme are subject to the following three progression rules (in addition to any rules applicable to their core programme):

1. If a student:
    a. does not achieve an overall merit level, or;
    b. fails more than 15 credits with a mark of less than 50, or;
    c. fails at least 15 credits with a mark of less than 40,

    they will revert to the degree without industry.

2. If a student fails more than 60 credits at the end of their second semester they will not be able to proceed with the programme, in accordance with Senate Regulation 6.28, and will have to cancel any arrangements made for placements.

3. If a student fails to secure a placement they will revert to the non-industry variant of their degree programme and will continue on to their final project/dissertation.

In the course of their placement the student will receive one or two support visits from a member of staff. The second 'visit' can be in the form of a Skype call. Typically where an overseas placement is secured both visits will be conducted via a Skype call.

Assessment of the Year in Industry

Students will be required to undertake reflective activities whilst on placement which are marked on a pass/fail basis.

11. Indicators of programme quality

Letters of support from industry.

External examiners' reports.

12. Criteria for award and classification

This programme follows the standard scheme of taught postgraduate award and classification set out in Senate Regulations – see the version of *Senate Regulation 6 governing taught postgraduate programmes of study* relevant to year of entry.

13. Progression points

As defined in Senate Regulations - refer to the version of *Senate Regulation 6 governing taught postgraduate programmes of study* relevant to 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 and a recommendation will be made to the Board of Examiners for an intermediate/exit award where appropriate.

14. Rules relating to re-sits or re-submissions

As defined in Senate Regulations - refer to the version of *Senate Regulation 6 governing taught postgraduate programmes of study* relevant to year of entry.

15. Additional information [e.g. timetable for admissions]

Given that Computer Science is a partner in this programme, programme-level monitoring will be carried out between Maths and Computer Science - the existing MSc Committee within Mathematics undertakes the role of the Board of Studies for this degree, with representation from Computer Science invited to the meetings twice a year. At these joint meetings the MSc Committee will undertake the annual developmental review of the programme and monitor students' performances.

16. External Examiners 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]

17. Additional features (e.g. timetable for admissions)

N/A

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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 Analysis for Business Intelligence with Industry

Updates to the programme

Academic year affected	Module Code(s)	Update
2024/25	MN7406 International Business	New optional module
2024/25	MA7023 Statistics for Data Science	Name change from 'Linear Statistical Models'

Credit breakdown

Status	Year long	Semester 1	Semester 2	Other delivery period
Core taught	n/a	45 credits	30 credits	n/a
Optional	n/a	15 credits	30 credits	n/a
Dissertation/project	60 credits	n/a	n/a	n/a

Choose an item. credits in total

Level 7/Year 1 2024/25

Core modules

Delivery period	Code	Title	Credits
Semester 1	MA7023	Statistics for Data Science	15 credits
Semester 1	MA7080	Mathematical Modelling	15 credits
Semester 1	MA7419	Fundamentals of Data Science	15 credits
Semester 2	MA7022	Data Mining and Neural Networks	15 credits
Semester 2	CO7002	Analysis and Design of Algorithms	15 credits

Notes
N/A

Option modules

Delivery period	Code	Title	Credits
Semester 1	CO7105	Advanced C++ Programming	15 credits
Semester 1	PA7081	Practical Programming	15 credits
Semester 2	MA7011	Computational Differential Equations with Applications	15 credits
Semester 2	MA7021	Generalised Linear Models	15 credits
Semester 2	MA7202	Introduction to Functional Data Analysis	15 credits
Semester 2	MN7406	International Business	15 credits

Core modules

Delivery period	Code	Title	Credits
Term 3	MA7098	MSc DABI Project	60 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.

The MSc DABI Project begins after the student has finished their industry placement.

Appendix 2: Module specifications

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