Programme Specification (Postgraduate)

FOR ENTRY YEAR: 2026/27

Date created: n/a **Last amended**25/04/2025 **Version no.** 1

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

MSc in Advanced Mechanical Engineering
MSc Advanced Mechanical Engineering with Industry
Postgraduate Diploma (PGDip) in Advanced Mechanical Engineering*
Postgraduate Diploma (PGDip) in Advanced Mechanical Engineering with Industry*
Postgraduate Certificate (PGCert) in Advanced Mechanical Engineering*

Notes

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

HECOS Code

HECOS Code	%
100190	100

2. Awarding body or institution

University of Leicester

3. a) Mode of study

MSc in Advanced Mechanical Engineering: Full time
MSc in Advanced Mechanical Engineering with Industry: Full time.
With Industry: The taught modules would all be taken in the first two semesters. This is followed by the industrial placement. This is followed by the in-house project, taking 13 weeks.

b) Type of study

The taught modules and project are campus based. The Industrial placement is off campus, on the site of the Placement Provider.

4. Registration periods

MSc in Advanced Mechanical Engineering (September start, Full-time)
The normal period of registration is 12 months.
The maximum period of registration is 24 months.

MSc in Advanced Mechanical Engineering with Industry (September start):
The normal period of registration is 24 months.
The maximum period of registration is 36 months.

5. Typical entry requirements

Candidates should normally have at least a good second class honours degree in a relevant subject from a British university; or a qualification recognized by the University as equivalent.

English language

Candidates whose first language is not English will be required to provide evidence of appropriate language skills. A score of 6.0 in IELTS or an equivalent is required, with no less than a score of 5.5 in any element, but if candidates have been instructed in their u/g courses in English in certain countries for a period of at least two years, this may be deemed adequate. Courses at the University's English Teaching Unit are offered to candidates who fail this requirement. The course must be completed before the MSc can begin.

6. Accreditation of Prior Learning

n/a

7. Programme aims

The course aims to introduce and develop state-of-the-art methodologies and techniques relevant to current and future strategies for the design of mechanical systems and components. Particular attention will be given to the development of investigative, modelling and computational strategies. The course covers fluid dynamics, solid structures, advanced and conventional materials and control systems.

Students should be able to:

- Demonstrate specific knowledge and understanding of advanced topics in Mechanical Engineering and to be able to apply this knowledge in the design and simulation of real-world systems;
- Describe their role in their company and the company's role in relation to customers and the industrial sector in which it sits;
- Continue to develop their professional engineering education through CPD programmes of related areas;
- Work effectively as part of both multi- and single-disciplinary teams;
- Demonstrate clear communication skills and be competent users of IT communication techniques (e.g. oral presentation and report writing);
- Pursue research (MSc graduates only);

The programmes aim to satisfy the criteria of the accrediting engineering institutions. These are based on the Engineering Council's Accreditation of Higher Education Programmes (AHEP4) learning outcomes. These are defined in 5 overarching engineering specific areas of learning:

- Science and Mathematics (M1)
- Engineering Analysis (M2-M4)
- Design and Innovation (M5)
- The Engineer and Society (M7)
- Engineering Practice (M16-M17)

The Programme-level Intended Learning Outcomes for the degree programmes are aligned, using the shorthand codes mentioned above, with the overarching outcomes outlined in Section 9 - Programme Outcomes. Each of these overarching, engineering-specific learning areas is further mapped to module-level Intended Learning Outcomes and assessment components, as specified in the module descriptions.

For the aims, learning outcomes and special features of the with Industry variant, please see 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
- University 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
- Engineering Accreditation Board (EAB) Masters Degree other than Integrated Masters, and EngD Learning Outcomes (AHEP 4th Edition)
- UK-SPEC (UK Standard for Professional Engineering Competence)

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?
Core knowledge of fluid dynamics, solid structures, advanced and conventional materials and of control systems.	Lectures, Specified reading, Laboratory classes, Design exercises, Tutorials	Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial performance
A successful student will be able to apply comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of engineering with a particular emphasis on research. This will be informed by a critical awareness of new development in the wider context of engineering (M1,-M2).	Lectures, Specified reading, Laboratory classes, Design exercises, Tutorials	Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial performance

ii) Concepts

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Design, selection and testing of materials, mechanisms in structures, design of flows, robust control	Lectures, Practical classes, Tutorials	Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial
A successful student will be able to design and implement innovative solutions to complex problems, demonstrating originality and addressing a combination of societal, user, business, and customer needs. This process will involve careful consideration of health and safety requirements, cultural and societal diversity, inclusivity, environmental and commercial factors, as well as adherence to relevant codes of practice and industry standards. (M5,M7)	Independent project, project supervision.	Major project report and presentation.

iii) Techniques

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Practical demonstration of experimental methods for fluid dynamics and structures. Competent use of standard and specialized engineering design tools. Model-based control	Laboratory classes, Individual Project and module design exercise supervision, Practical demonstrations, Lectures	Laboratory and design exercise reports, module design exercise assessment, Individual Project progress and report, Module examinations
A successful student will be able to select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed. (M3)	Laboratory classes, Individual Project and module design exercise supervision, Practical demonstrations, Lectures	Laboratory and design exercise reports, module design exercise assessment, Individual Project progress and report, Module examinations

iv) Critical analysis

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Critical appraisal of results. Critical review of literature	Laboratory, design exercise and project supervision	Laboratory, module design exercise and literature review reports, Project progress and report
A successful student will be able to analyse, evaluate, and critique complex problems, formulating well-reasoned solutions and conclusions based on sound engineering judgment. This process involves assessing available data using fundamental principles of mathematics, statistics, natural sciences, and engineering. Students will apply scientific reasoning to work with information that may be uncertain or incomplete and will critically discuss the limitations of the techniques and methods employed. (M2, M13)	Lecture, tutorial, computer practical class, coursework assignment, presentation.	Examination, Oral presentation, contribution to discussion, problem-based exercise, project report.
A successful student will be able to assess the environmental and societal impacts of solutions to complex problems, considering the entire life cycle of a product or process, and take steps to minimize negative effects. (M7, M8)	Lecture, group project, independent project.	Project report, coursework assignment, presentation.

v) Presentation

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Presentation of scientific results, Participation in scientific discussion	Tutorials, Module seminars, Laboratory classes, module design exercise supervision, Project supervision	Module presentations, Laboratory, module design exercise and Individual project report

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
A successful student will be able to communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used. (M16-M17)	Tutorials, Module seminars, Laboratory classes, module design exercise supervision, Project supervision	Module presentations, Laboratory, module design exercise and Individual project report

vi) Appraisal of evidence

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Experimental methods, Project design	Lectures, Laboratory classes, Project supervision	Written examinations, laboratory and design exercise reports, Project reports
A successful student will demonstrate the ability to locate, analyse, and critically evaluate technical literature and other information sources to develop solutions for complex problems. (M3, M4)	Substantial project work, including team meetings and assisted learning during supervision meetings.	Project report and presentation.
A successful student will be able to assess customer and user needs while considering the broader engineering context. (M5, M6)	As above	As above

b) Transferable skills

i) Research skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Literature review, Experimental design, Laboratory skills, Data analysis	Tutorials, lectures, Laboratory classes, module design exercise work, Project supervision meetings	Module design exercise reports and oral presentations, Course work, Individual project report

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
A successful student will be able to select and critically evaluate technical literature and other sources of information to solve complex problems. (M4)	Major project work, including team meetings and supervision meetings.	Project report and presentation.

ii) Communication skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Report writing, Scientific Communication	Project supervision meetings, laboratory and design exercise classes, Tutorials	Laboratory, design exercise and literature review reports, Individual project report
Present technical and non-technical information orally, in an appropriate form for a given audience (M17).	Tutorial, group project, independent research, project supervision.	Presentation
Communicate technical and non-technical information in an appropriate written form for a given audience (M16-M17).	Group project, independent research, project supervision.	Written assignment, project report, group report.

iii) Data presentation

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
IT, Analytical and graphical methods, CAD drawings, Statistics	Project supervision meetings, course work (laboratories, module design exercises)	Seminars, Course work reports, Project reports, Module examinations

iv) Working relationships

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Project management, Organization skills, Time management, Working in groups	Project supervision meetings, Group working in modules (laboratories and design exercises)	Module design exercise assessment, Seminar performance

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
A successful student will be able to work effectively both independently and as part of a team, including taking on leadership roles. They will also be able to assess and improve their own performance as well as the performance of the team. (M16).	Lecture, tutorial, group project, project supervision.	Group report, presentation, Individual report.

v) Managing learning

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Study skills, Information management, Developing specialization and interests, Project management	Tutorials and seminars, Library and IT skills sessions, project supervision meetings	Course work, module design exercise assessment, project assessment

10. Special features

The course is accredited by the Institution of Mechanical Engineers (IMechE) and the Institution of Engineering and Technology) IET subject to 5 yearly re-accreditation.

10a. 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 into the curriculum.	RESEARCH-BRIEFED: This program offers students comprehensive exposure to real-world engineering challenges through an individual project and a collaborative group design study. The topics for these projects and studies are closely aligned with the university's current research interests, fostering the development of problem-solving skills that can be directly applied to engineering practice.
Research-based Framed enquiry for exploring existing knowledge.	RESEARCH-BASED: Students engage directly with research challenges presented by various scientific experts. Most lecturers and professors at the university balance dual roles as educators and researchers, actively conducting innovative studies across diverse fields. Through lectures, workshops, and tutorials, students tackle practical, real-world problems, fostering the development of a wide range of skills such as design, optimization, and modelling.

Research-oriented Students critique published research content and process.	RESEARCH ORIENTED:-Students are trained to analyse and evaluate research critically while assessing their own findings to cultivate a solid scientific approach. Additionally, assessments and workshops are designed to reinforce this approach, building both empirical and computational skills with a focus on real-world engineering applications.
Research-apprenticed Experiencing the research process and methods; building new knowledge.	RESEARCH-APPRENTICED: Extensive practice and training are offered, particularly in report writing and teamwork. Essential research skills, including searching for and reading research papers as well as proper referencing, are integral to group activities and workshops, fostering the development of key competencies. Students also enhance their individual and group presentation abilities by showcasing their findings through written reports, posters, and oral presentations. The EG720 Individual Project is a capstone experience that allows students to demonstrate and integrate the skills and knowledge gained during their master's program. It emphasizes the synthesis of technical expertise, critical thinking, and problem-solving abilities, preparing students to meet the professional competencies expected of engineering graduates.

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:

Our engineering seminars, held twice a month, provide students with an interdisciplinary perspective on cutting-edge research. Guest speakers from various fields share their key research findings and insights into their career paths. These seminars offer students the opportunity to engage directly with the speakers through questions and discussions.

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.

Module convenors actively participate in educational committee meetings that provide updates on the school's teaching activities. Beyond the engineering seminar, they stay informed about the school's research through regular special interest group meetings. Additionally, teaching away days are held frequently, featuring examples of best practices, seminars by educational speakers, and general teaching guidance.

11. Indicators of programme quality

The programme is subject to all normal departmental, college and institutional academic quality assurance processes.

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.

The following additional award requirements for this programme have been approved:

- This programme follows the Scheme of Assessment for Master degree programmes, comprising 120 credits of taught modules and a 60-credit project. In accordance with Engineering Council requirements for accreditation, a variation applies whereby a maximum of 15 credits may be considered as a "Compensated Pass" for modules with marks between 40% and 49.99%, provided that no other modules are failed (mark between 0% and 39.99%). In addition, the Taught Credit Weighted Average must be 50.00% or above in line with Senate Regulation 6. Students who do not meet this criterion will be considered for an interim award based on the taught component of the programme.
- A student who successfully completes an industry placement but does not meet the award requirements for an MSc may be considered for the exit award of PGDip with industry.

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.

The following additional award requirements for this programme have been approved:

A Placement Student will revert back to the degree without Year in Industry if:

1. At the Board of Examiners following the 1st and the 2nd semester of study, they fail to achieve a pass mark (50.00%) for all modules.
2. They fail to secure an industrial placement role.
3. They fail to pass the assessment related to the industrial placement.
4. 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 will need to return to the University and carry out an in-house project in the School or Department, as per the normal non-Industry MSc. 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. They discontinue their industrial placement and carry out an in-house project in the School or Department, as per the normal non-Industry MSc.

Any student not meeting the criteria set under point 1 will typically revert to the non-industry variant of the degree programme and undertake any re-sits as determined by a Board of Examiners in line with Senate Regulations.

The Board of Examiners may use its discretion when considering modules failed with accepted

mitigating circumstances.

For further details regarding the progression requirements of the "with industry" variant of the programme please see: https://le.ac.uk/study/postgraduates/courses/industry-2025-26.

In the event that a Placement Student is moved to the standard campus-based MSc, the Placement Provider will be notified immediately. For overseas students, the UKVI will also be informed immediately. Placement Providers will be made aware that any contract of employment shall be made subject to satisfactory completion of the taught part of the MSc.

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. 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]

16. **Additional features** (e.g. timetable for admissions)

n/a

UNIVERSITY OF LEICESTER

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

Date created: n/a **Last amended**25/04/2025 **Version no.** 1

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 Advanced Mechanical Engineering – September Intake

Credit breakdown

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

180 credits in total

Level 7/Year 1 2026/27

Core modules

Delivery period	Code	Title	Credits
Semester 1	EG7010	Engineering Design Case Study	15 credits
Semester 1	EG7115	Fluid Stability, Transition and Turbulence	15 credits

Delivery period	Code	Title	Credits
Semester 1	EG7116	Advanced Solid Mechanics	15 credits

Option modules

Delivery period	Code	Title	Credits
Semester 1	EG7015	Rotorcraft Mechanics and Control	15 credits
Semester 1	EG7413	Spacecraft Systems Engineering	15 credits
Semester 2	EG7324	Signal Processing	15 credits
Semester 2	EG7126	Advanced Composite Materials	15 credits
Semester 2	EG7040	Attitude & Orbit Control Systems	15 credits
Semester 2	EG7422	Advanced Gas Turbines	15 credits
Semester 2	EG7125	Computational Fluid Dynamics	15 credits
Term 3	EG7020	Individual 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.

Level 7/Year 2 2027/28 (for students on the with Industry variant)

Core modules

Delivery period	Code	Title	Credits
Choose an item.	ADEG7223	On Placement*	n/a
Choose an item.	EG7020	Individual Project	60 credits

Notes

The ”with industry” programme includes an industrial placement following the end of the final exam period of the taught phase of the programme, with students returning to UoL to complete the project/dissertation after their placement.

MSc Advanced Mechanical Engineering – January Intake

Credit breakdown

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

180 credits in total

Level 7/Year 1 2025/26

Option modules

Delivery period	Code	Title	Credits
Semester 2	EG7324	Signal Processing	15 credits
Semester 2	EG7126	Advanced Composite Materials	15 credits
Semester 2	EG7040	Attitude & Orbit Control Systems	15 credits
Semester 2	EG7422	Advanced Gas Turbines	15 credits
Semester 2	EG7125	Computational Fluid Dynamics	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.

Level 7/Year 2 2026/27

Core modules

Delivery period	Code	Title	Credits
Semester 1	EG7010	Engineering Design Case Study	15 credits
Semester 1	EG7115	Fluid Stability, Transition and Turbulence	15 credits
Semester 1	EG7116	Advanced Solid Mechanics	15 credits
Choose an item.	ADEG7223	on Placement*	n/a
Choose an item.	EG7020	Individual Project	60 credits

Notes

The ”with industry” programme includes an industrial placement following the end of the final exam period of the taught phase of the programme, with students returning to UoL to complete the project/dissertation after their placement.

Option modules

Delivery period	Code	Title	Credits
Semester 1	EG7015	Rotorcraft Mechanics and Control	15 credits
Semester 1	EG7413	Spacecraft Systems Engineering	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.

Appendix 2: Module specifications

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