Programme Specification (Postgraduate)

FOR ENTRY YEAR: 2025/26

Date created: Click or tap here to enter text. **Last amended:**25/04/2025 **Version no.** 1

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

MSc in Advanced Mechanical Engineering with Management

MSc in Advanced Mechanical Engineering with Management and Industry

Postgraduate Diploma (PGDip) in Advanced Mechanical Engineering with Management*

Postgraduate Diploma (PGDip) in Advanced Mechanical Engineering with Management and Industry*

Postgraduate Certificate (PGCert) in Advanced Engineering with Management*

Postgraduate Certificate (PGCert) in Advanced Engineering*

Postgraduate Certificate (PGCert) in Engineering with Management*

Postgraduate Certificate (PGCert) in Management*

Notes

* An award marked with an asterisk is only available as an exit award and is not available for students to register onto and is not accredited with the Engineering Council

HECOS Code

HECOS Code	%
100190	75
100089	25

2. Awarding body or institution

University of Leicester

3. a) Mode of study

MSc/PGDip in Advanced Mechanical Engineering with Management: Full-time

MSc in Advanced Mechanical Engineering with Management and Industry: Full-time.

With Industry only: The taught modules would all be taken in the first two semesters. This is followed by the industrial placement, which is between 3 and 12 months long, and would be taken following the end of the first year January exam period. This is followed by the in-house project, taking 10 weeks.

b) Type of study

The taught modules and project are campus based.

The Industrial placement ('with Industry' programme only) is off campus, on the site of the Placement Provider.

4. Registration periods

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

5. Typical entry requirements

Academic:

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 6.5 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

None

7. Programme aims

This is an advanced career entry programme focussed on industrial careers in the engineering sector. The technical focus of this programme is state-of-the-art methodologies and techniques relevant to 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 in combination with a rigorous introduction to those management theories, models, frameworks and techniques that are likely to be important to a professional Engineer. The combination of advanced technical Engineering skills and knowledge of Management theory and practice equips students with the knowledge and skills required to secure leadership roles in global engineering industries. At the end of the programme students should:

- Demonstrate specific knowledge of advanced topics in engineering, specifically in mechanical fields, and to be able to apply this knowledge in the design and simulation of real-world systems;
- Demonstrate clear communication skills and be competent users of IT communication techniques (e.g. oral presentation and report writing);
- Work effectively as part of both multi- and single-disciplinary teams;
- Have knowledge of core management subjects, be able to explain them, critique them, select, apply them to engineering management situations
- 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)

Programme-level Intended Learning Outcomes for the degree programmes are mapped, using the shorthand codes above, to these overarching outcomes in section 9 - Programme Outcomes below. Each of these overarching engineering specific areas of learning are mapped to module-level Intended Learning Outcomes and assessment elements, and are detailed in the module specifications.

For the aims, learning outcomes and special features of the Year in Industry, please see https://le.ac.uk/study/postgraduates/courses/industry

8. Reference points used to inform the programme specification

- QAA Benchmarking Statement
- Framework for Higher Education Qualifications (FHEQ)
- UK Quality Code for Higher Education
- 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)
- Engineering Council Compensation and Condonement requirements November 2021.
- 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

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, surfaces, MATLAB / CAD and control systems. A core knowledge of management subjects including the business environment, accountability, representation and control. Knowledge of the quantitative and qualitative methods used in management research and what constitutes a methodology. Students should be able to synthesise and apply knowledge to engineering management issues.	Lectures, Specified reading, Laboratory classes, Design exercises, Tutorials, Group discussion, directed reading and exercises, private study, assignment feedback: formative and summative. Dissertation research process, research methods training.	Module examinations, Laboratory, design exercises, literature review reports, oral presentations and tutorial performance. Essays (individual), group discussions, computer based exercises, case study exercises. Research proposal, ethics approval and dissertation.
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).	As above	As above

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. Graduates should be able to explain the core concepts of management as they relate to engineering activities.	Lectures, Practical classes, Tutorials, Group discussion, Directed reading, assignment feedback, private-study. Dissertation supervision process, independent research.	Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial. Essays (individual), group discussions, case study exercises, research proposal and dissertation.
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 Competent use of a variety of engineering design tools, conventions of academic writing and qualitative and quantitative evaluation to solve management problems relevant to engineering.	Laboratory classes, Individual independent project and research, module design exercise supervision, Practical demonstrations, Lectures. Self-directed private-study. Assignment feedback, formative and summative. Dissertation research process and methods training.	Laboratory and design exercise reports, module design exercise assessment, essays (individual), group discussions, case study exercises, and the dissertation. 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 independent project and research, module design exercise supervision, Practical demonstrations, Lectures. Self-directed private-study. Assignment feedback, formative and summative. Dissertation research process and methods training.	Laboratory and design exercise reports, module design exercise assessment, essays (individual), group discussions, case study exercises, and the dissertation. Module examinations.

iv) Critical analysis

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Critical appraisal of results and literature, the discipline of management and its application in engineering, including in different cultural, environmental and organisational contexts.	Laboratory, design exercise and project supervision	Laboratory, module design exercise and literature review reports. Essays (individual), group discussion, case study exercises. Project progress and dissertation.
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, management analysis and conclusions in an organized and appropriate medium to a professional standard with clarity, fluency and coherency. Participation in scientific discussion.	Tutorials, Module seminars, Laboratory classes, module design exercise supervision, Project supervision, group discussion, directed reading and exercises. Dissertation.	Module presentations, Laboratory, module design exercise and dissertation. Essays, examinations and case study exercises.
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, group discussion, directed reading and exercises. Dissertation.	Module presentations, Laboratory, module design exercise and dissertation. Essays, examinations and case study exercises.

vi) Appraisal of evidence

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Experimental methods, Project design. Ability to locate, organise and assess data, analyse complex ideas and understand and criticise different arguments with independent inquiry at an advanced level.	Lectures, Laboratory classes, Project supervision. Independent research, group discussion, directed reading and exercises.	Written examinations, laboratory and design exercise reports, dissertation, individual essays.

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
A successful student will demonstrate the ability to locate, analyze, 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)	Substantial project work, including team meetings and assisted learning during supervision meetings.	Project report and presentation.

b) Transferable skills

i) Research skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Literature review, Experimental design, Laboratory skills, Data analysis. Demonstration of intellectual independence through identifying and delivering a credible and substantial research project at an advanced level.	Tutorials, lectures, Laboratory classes, module design exercise work. Research methodology module, dissertation supervision meetings.	Module design exercise reports and oral presentations, Course work, dissertation.
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. Ability to work collaboratively and responsibility in teams.	Dissertation supervision meetings, laboratory and design exercise classes, Tutorials/dissertation supervision process.	Laboratory, design and group exercise reports. Research proposal and dissertation.
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. Ability to locate, organise and marshal evidence and select and apply appropriate software packages for quantitative analysis.	Dissertation supervision meetings, course work (laboratories, module design exercises, case studies and self-directed private study)	Seminars, Course work/case-study reports, Research proposal and dissertation, Module examinations

iv) Working relationships

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Project management, Organization skills, Time management, Collaborative and responsible working in teams.	Dissertation supervision meetings (incl. the establishment of a working relationship with supervisor), Group working in modules (laboratories and design exercises).	Formative assessment based on informal qualitative feedback on content and performance from teacher and peers. Module design exercise assessment, Seminar performance. Dissertation.
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. Ability to reflect upon behaviour and skills with a view to personal and professional development. Identifying and delivering a credible and substantial research project at an advanced level.	Tutorials and seminars, Library and IT skills sessions, dissertation supervision meetings and process.	Course work, module design exercise assessment, Research proposal and dissertation.

vi) Career management

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Ability to reflect on motivation, strengths, interests and skills with a view to personal and professional development. Research an area which may be relevant to the student's career preferences.	Tutorials, independent self-directed research into career opportunities using CDS. Dissertation research.	Discussion within forums/tutorials, Development Plan. Dissertation.

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 Engineering Management 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

As defined in Senate Regulation 6: Regulations governing taught postgraduate programmes of study.

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

- This programme follows the Scheme of Assessment for Master degree programmes with a structure of 120 credits of taught modules and a project of 60 credits, with the variation (required by the Engineering Council for accreditation purposes) that a maximum of 15 credits may be failed at grade D (40-49%) and no credits failed at grade F (0-39%). Students who fail to 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 management and industry.

Special conditions apply for the PGCert exit route to ensure engineering / management learning outcomes achieved are appropriate to the title of the award. The title of award offered, a function of the number of modules passed in each discipline and therefore the balance of ILOs achieved, is detailed in the Table below:

AWARD MATRIX FOR TAUGHT MODULES (NUMBER IN BRACKETS IS CREDITS PASSED)		NUMBER OF 15-CREDIT MN7xxx MODULES PASSED			
		0	1	2	3
NUMBER OF 15- CREDIT EG7xxx MODULES PASSED	0	FAIL (0)	FAIL (15)	FAIL (30)	PGCert IN MANAGEMENT (45)
	1	FAIL (15)	FAIL (30)	PGCert IN ENGINEERING WITH MANAGEMENT (45)	PGCert IN ENGINEERING WITH MANAGEMENT (60)
	2	FAIL (30)	PGCert in ENGINEERING WITH MANAGEMENT (45)	PGCert IN ENGINEERING WITH MANAGEMENT (60)	PGCert IN ENGINEERING WITH MANAGEMENT (75)
	3	PGCert in ENGINEERING (45)	PGCert in ENGINEERING WITH MANAGEMENT (60)	PGCert IN ENGINEERING WITH MANAGEMENT (75)	PGDip IN (respective discipline) ENGINEERING WITH MANAGEMENT (90)
	4	PGCert in ENGINEERING (60)	PGCert in ENGINEERING WITH MANAGEMENT (75)	PGDip IN (respective discipline) ENGINEERING WITH MANAGEMENT (90)	MSc/PGDip IN (respective discipline) ENGINEERING WITH MANAGEMENT (105)

	5	PGCert in ENGINEERING (75)	PGDip IN (respective discipline) ENGINEERING WITH MANAGEMENT (90)	MSc/PGDip IN (respective discipline) ENGINEERING WITH MANAGEMENT (105)	MSc/PGDip IN (respective discipline) ENGINEERING WITH MANAGEMENT (120)

13. Progression points

As defined in Senate Regulation 6: Regulations governing taught postgraduate programmes of study.

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 semester 1 exam board, they have less than one module at merit level and any failed modules at <50%. No progression rule is applied at the semester 2 exam board. In the case of failed modules with mitigating circumstances, the semester 1 board will use its discretion.
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.

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.

Three months is the minimum time required for an industrial placement to be formally recognised. If the industrial placement is terminated earlier than 3 months as a result of event outside of the Placement Students control (for example redundancy, or company liquidation), the following process will be adopted:

1. If the Placement Student has completed less than 2 months, they will be supported to search for another placement to take them up to the required minimum of 3 months for the industrial placement to be formally recognised. If the Placement Student does not find a placement to meet this criteria they will be required to suspend and transferred onto the degree without industry.
2. If the Placement Student has completed 2 months, they will be supported to search for another placement to take them up to the 3 months required for the industrial placement to be formally recognised. If the Placement Student cannot source an additional placement to take them to 3 months, assessments related to the industrial placement will be set for the

student to make it possible for the individual learning objectives for the industrial placement to be met. This will allow with industry to be recognised in the degree certificate.

3. The duration of time between the two Placement Providers to meet the minimum 3 months of an industrial placement must not exceed the period of time required to comply with visa requirements.
4. A Placement Student is permitted to undertake an industrial placement which runs across two academic years.

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]

UNIVERSITY OF LEICESTER

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

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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 Advanced Mechanical Engineering with Management

Credit breakdown

Status	Year long	Semester 1	Semester 2	Other delivery period
Core taught	n/a	75 credits	15 credits	n/a
Optional	n/a	n/a	30 credits	n/a
Dissertation/project	n/a	n/a	n/a	60 credits

180 credits in total

Level 7/Year 1 **2025/26**

Core modules

Delivery period	Code	Title	Credits
Semester 1	EG7010	Engineering Design Case Study	15 credits
Semester 1	EG7115	Fluid Instability, Transition and Turbulence	15 credits
Semester 1	EG7116	Advanced Solid Mechanics	15 credits

Delivery period	Code	Title	Credits
Semester 1	AF7437	Accounting and Finance for Non-Specialist Managers^	15 credits
Semester 1	EC7436	Principles of Business Economics^	15 credits
Semester 2	MK7406	International Business^	15 credits
Term 3	EG7302	Engineering Management Project*	60 credits

Option modules

Delivery period	Code	Title	Credits
Semester 2	EG7125	Computational Fluid Dynamics**	15 credits
Semester 2	EG7126	Advanced Composite Materials**	15 credits
Semester 2	EG7422	Advanced Gas Turbines**	15 credits

Notes

^Management specialist modules delivered by the School of Business.

**Technical specialist modules delivered by the School of Engineering of which students must choose 30 credits in Semester 2.

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 (for students on the with Industry variant)

Core modules

Delivery period	Code	Title	Credits
	ADEG7223	On Placement*	n/a
	EG7302	Engineering Management Project*	60 credits

Notes

The ”with industry” programme includes an industrial placement of 3-12 months, 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

Appendix 2: Module specifications

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