



Programme Specification (Postgraduate)

FOR ENTRY YEAR: 2022/23

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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 (exit award only)

Postgraduate Diploma (PGDip) in Advanced Mechanical Engineering with Management and Industry (exit award only)

Postgraduate Certificate (PGCert) in Advanced Engineering with Management (exit award only)

Postgraduate Certificate (PGCert) in Advanced Engineering (exit award only)

Postgraduate Certificate (PGCert) in Engineering with Management (exit award only)

Postgraduate Certificate (PGCert) in Management (exit award only)

[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 6.0 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);

For the 'with industry' variant only, these additional programme aims apply:

- Prepare students for career and training opportunities which relates to their degree – in both the private and public sectors, and voluntary organisations.
- Construct effective applications for placement opportunities
- Provide students the opportunity to recognise suitable plans for transitioning into the workplace

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 3rd Edition)
- UK-SPEC (UK Standard for Professional Engineering Competence)
- Engineering Council Compensation and Condonement requirements November 2018.
- University Learning Strategy
- University Assessment Strategy
- 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?
<p>Core knowledge of fluid dynamics, solid structures, advanced and conventional materials, surfaces, MATLAB / CAD and control systems.</p> <p>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.</p> <p>With Industry: apply knowledge acquired to real world scenarios, through the industrial placement.</p>	<p>Lectures, Specified reading, Laboratory classes, Design exercises, Tutorials, Group discussion, directed reading and exercises, private study, assignment feedback: formative and summative.</p> <p>Dissertation research process, research methods training.</p> <p>With Industry: Placement preparation and supervision.</p>	<p>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.</p> <p>With Industry: Placement assessment and reports.</p>

ii) Concepts

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
<p>Design, selection and testing of materials, mechanisms in structures, design of flows, robust control.</p> <p>Graduates should be able to explain the core concepts of management as they relate to engineering activities.</p>	<p>Lectures, Practical classes, Tutorials, Group discussion, Directed reading, assignment feedback, private-study.</p> <p>Dissertation supervision process, independent research.</p>	<p>Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial. Essays (individual), group discussions, case study exercises, research proposal and dissertation.</p>

iii) Techniques

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
<p>Practical demonstration of experimental methods for fluid dynamics and structures. Competent use of standard and specialized engineering design tools. Model-based control</p> <p>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.</p> <p>With Industry: Practical experience in the application of engineering techniques acquired in the course to real world scenarios, through the industrial placement.</p>	<p>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.</p> <p>With Industry: Placement preparation and supervision.</p>	<p>Laboratory and design exercise reports, module design exercise assessment, essays (individual), group discussions, case study exercises, and the dissertation. Module examinations.</p> <p>With Industry: Placement assessment and reports.</p>

iv) Critical analysis

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
<p>Critical appraisal of results and literature, the discipline of management and its application in engineering, including in different cultural, environmental and organisational contexts.</p>	<p>Laboratory, design exercise and project supervision</p>	<p>Laboratory, module design exercise and literature review reports. Essays (individual), group discussion, case study exercises. Project progress and dissertation.</p>

v) Presentation

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
<p>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.</p> <p>With Industry: report key responsibilities and achievements from their placement.</p>	<p>Tutorials, Module seminars, Laboratory classes, module design exercise supervision, Project supervision, group discussion, directed reading and exercises. Dissertation.</p> <p>With Industry: Placement preparation and supervision.</p>	<p>Module presentations, Laboratory, module design exercise and dissertation. Essays, examinations and case study exercises.</p> <p>With Industry: Placement assessment and reports.</p>

vi) Appraisal of evidence

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
<p>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.</p> <p>With Industry: evaluate critically their impact and results achieved in the workplace environment.</p>	<p>Lectures, Laboratory classes, Project supervision. Independent research, group discussion, directed reading and exercises.</p> <p>With Industry: Placement preparation and supervision.</p>	<p>Written examinations, laboratory and design exercise reports, dissertation, individual essays.</p> <p>With Industry: Placement assessment and reports.</p>

b) Transferable skills

i) Research skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
<p>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.</p>	<p>Tutorials, lectures, Laboratory classes, module design exercise work. Research methodology module, dissertation supervision meetings.</p>	<p>Module design exercise reports and oral presentations, Course work, dissertation.</p>

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.
With Industry: Communicate effectively in a modern industrial environment.	With Industry: Placement preparation and supervision.	With Industry: Placement assessment and reports.

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.
With Industry: communicate professionally through selection processes and networking opportunities.	With Industry: Placement preparation and supervision.	With Industry: Placement assessment and reports.

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.

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
<p><i>With industry students only:</i></p> <ol style="list-style-type: none"> 1. Select appropriate resources for researching/securing placement opportunities 2. Explain the process for applying for and securing a relevant placement 3. Construct effective applications for placement opportunities 4. Recognise suitable plans for transitioning into a placement 5. Apply the theoretical and practical aspects of the material studied at the University and demonstrate the personal and professional skills necessary for your role within the organisation. 6. Compose a Professional Development Plan considering your strengths, development areas and motivations for your next step 7. Modify your CV to include the skills and experience you have gained through your significant experience gained in the past 12 months. 	<p>Placement preparation 1 & 2:</p> <p>Students are provided with dedicated and timetabled sessions to prepare to search and secure an industrial placement.</p> <p>Problem solving classes, Masterclasses, Career development programmes, Independent research.</p> <p>On placement:</p> <p>Students undertake a minimum of 3 months experience in the workplace.</p> <p>Project supervision, independent research</p>	<p>Formative module feedback through session tasks and exercises</p> <p>Completion of Monthly Reflective Journals to record skills development, major achievements, key areas of work, learning points and challenges overcome.</p> <p>Assessed by a Placement Portfolio, comprising of a Reflective Summary, Professional Development Plan, and Updated CV (excluded from word count) to formally assess on a pass or fail basis.</p> <p>Formative feedback during a Placement Visit (in person or via Skype) from Placement Provider and Placement Tutor regarding reflection on skills development, areas of strength and weakness and contribution to the workplace.</p>

10. Special features

This course is accredited by IMechE and IET subject to 5 yearly re accreditation.-With Industry:

- i. After completing the eight taught modules and exams in the first year of the course, students will carry out between 3 and 12 months employment in an industrial placement. Students will be encouraged to undertake the maximum period of employment possible, to gain the full benefit of experience in industry.
- ii. On the return from an industrial placement, the Placement Student will carry out an in-house project in the School or Department, as per the normal non-Industry MSc The project will be supervised and assessed within the Department. The project title will be decided, in conjunction with the Placement Student, while they are on placement.

iii. During the industrial placement, appropriate support will be provided by the School or Department as defined in the Code of Practice.

iv. Placement Students will be expected to complete a Monthly Reflective Journal to record their training. This will support the Placement Student to complete the Placement Portfolio which is assessed on a pass/fail basis, and will have no credit weighting in the MSc.

v. Placement Students who do not pass the assessment or meet the minimum duration of an industrial placement will receive the standard MSc degree.

11. Indicators of programme quality

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

It is the student's responsibility to secure an industrial placement. Students are invited to attend Placement Preparation modules, additional support workshops and 1-2-1 appointments with the Career Development Service. Employer led activities provide a platform for students to engage with organisations who are recruiting students for year in industry roles.

The 'with Industry' MSc relies on the Placement Provider to provide work suitable for an MSc student. To ensure the role is relevant, the School or Department assesses the industrial placement through the University's Placement Approval Process. The Placement Provider will be asked to provide:

- An indication of the area of the organisation where the Placement Student will work.
- An indication of the area of expertise that the Placement Student should have or will gain.
- Whether the work is suitable only for a UK national, for and EU national or for an overseas student.
- The resources available to the Placement Student. For example, design software, textbooks, laboratory equipment, product specimens, access to facilities in the organisation.
- Identification of a suitable industrial mentor (i.e. a graduate with knowledge of the area and at least a couple of years of experience in the field).

When a Placement Student starts an industrial placement, they will be required to complete health and safety documents and confirm they have completed a formal induction process no later than the 2nd week of placement.

Placement Students will be provided with a Study Guide for their industrial placement and support them to complete the assessment. The School or Department will undertake a placement 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.

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)
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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 UKBA will also be informed immediately. Placement Provider's will be made 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]

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 affected	Module Code(s)	Update
2022/23	MN7401	New optional module
2022/23	MN7374	New optional module
2022/23	MN7403	New optional module
2022/23	MN7402	New optional module

MSc Advanced Mechanical Engineering with Management

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	30 credits	45 credits	n/a
Dissertation/project	n/a	n/a	n/a	60 credits

180 credits in total

Level 7/Year 1 2022/23 Choose an item.

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
Semester 1	ADEG7221	Placement Preparation 1*	n/a
Semester 2	ADEG7222	Placement Preparation 2*	n/a

Notes

* The 'with Industry' programme includes additional preparation modules and an industrial placement of 3-12 months, following the end of the first year exam period, with students returning to UoL to complete the project/dissertation after their placement.

Option modules

Delivery period	Code	Title	Credits
Semester 1	MN7403	Accounting and Finance for Managers*	15 credits
Semester 1	MN7402	Business Economics*	15 credits
Semester 1	MN7401	Organisational Behaviour*	15 credits
Semester 2	MN7406	International Business *	15 credits
Semester 2	MN7374	International Human Resources Management*	15 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 School of Business of which students must choose 30 credits in Semester 1 and 15 credits in Semester 2.

**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 2022/23

Core modules

Delivery period	Code	Title	Credits
Choose an item.	ADEG7223	On Placement*	n/a
Choose an item.	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](#) (Note - modules are organized by year of delivery).