UNIVERSITY OF LEICESTER

Programme Specification (Postgraduate)

FOR ENTRY YEAR: 2026/27

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

MSc in Embedded Systems and Control Engineering
MSc in Embedded Systems and Control Engineering with Industry
Postgraduate Diploma in Embedded Systems and Control Engineering*
Postgraduate Diploma in Embedded Systems and Control Engineering with Industry*
Postgraduate Certificate in Embedded Systems and Control 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	%
100184	100

2. Awarding body or institution

University of Leicester

3. a) Mode of study

Full-time

b) Type of study

Campus-based

4. Registration periods

September intake

The normal period of registration for the MSc in Embedded Systems and Control Engineering is 12 months

The maximum period of registration for the MSc in Embedded Systems and Control Engineering is 24 months

The normal period of registration for the MSc in Embedded Systems and Control Engineering with Industry is 24 months

The maximum period of registration for the MSc in Embedded Systems and Control Engineering with Industry is 33 months

January intake

The normal period of registration for the MSc in Embedded Systems and Control Engineering is 16 months

The maximum period of registration the MSc in Embedded Systems and Control Engineering is 28 months

The normal period of registration for the MSc in Embedded Systems and Control Engineering with Industry is 28 months

The maximum period of registration for the MSc in Embedded Systems and Control Engineering with Industry is 40 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.
Candidates who have acquired experience through work or other means that enables staff responsible for admissions to be confident of the candidate's ability to succeed in the programme will be considered.
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 / technology sector. The focus of this programme is to develop specific knowledge and understanding of topics in Embedded Systems and Control Engineering and to be able to apply this knowledge in the design and simulation of real-world systems.
It incorporates modules to teach the mathematical basis of control for all engineering systems and also to apply this knowledge to specific systems, such as power -grids and motors. The programme also includes practical work to allow students to gain hands-on practice at developing code for their own small microcontroller-based embedded systems.
The combination of advanced theory and practical skills will equip students with the skills required to understand the importance od control in engineering systems and appreciate the difference between different levels of control robustness.

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-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)
- Engineering Council Compensation and Condonement requirements November 2021

9. Programme Outcomes

Unless otherwise stated, programme outcomes apply to all awards specified in 1. Programme title(s).

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
(a) Subject and Professional skills		
Knowledge		
Apply comprehensive knowledge of the embedded systems architecture and design, control and signal processing and engineering principles to the solution of complex embedded systems and control engineering problems. The knowledge will be informed by a critical awareness of new developments in embedded systems and control engineering and related fields (M1).	Lectures, specified reading, Laboratory classes, Design exercises, Tutorials. Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial performance.	Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial performance.
Concepts		
Formulate and analyse complex problems to reach substantiated conclusions, applying principles of mathematics, control engineering, real-time systems programming, digital signal processing, and hardware interfacing. Use engineering judgement to address uncertainty and discuss the limitations of the techniques employed. (M2)	Lecture, tutorial, computer practical class, coursework assignment, presentation.	Module examinations, Laboratory, design exercise and literature review reports, oral presentations, tutorial.
Design solutions for complex problems in control systems, embedded systems, real-time simulations, and signal processing that demonstrate originality and address societal, user, and customer needs. This includes consideration of health & safety, diversity, inclusion, cultural, societal, environmental, and	Independent project, project supervision. Major project report and presentation.	Major project report and presentation.

commercial factors, while ensuring compliance with relevant codes of practice and industry standards. (M5)		
Techniques		
Select and apply appropriate computational and analytical techniques, including state-of-the-art design and simulation software for control system design, offline signal processing, and real-time scheduling, to model complex problems, while critically 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
Critical analysis		
Select, critically evaluate, and review technical literature and other information sources to solve complex problems, including a critical appraisal of results and a thorough assessment of the relevant literature.(M4)	Laboratory, design exercise and project supervision	Laboratory, module design exercise and literature review reports, Project progress and report
Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed. (M2)	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 evaluate the environmental and societal impact of solutions to	Lecture, group project, independent project.	Project report, coursework assignment, presentation.

complex problems (to include the entire life cycle of a product or process) and minimise adverse impacts. (M7)		
Presentation		
Communicate effectively on complex engineering matters with both technical and non-technical audiences, presenting scientific results clearly and participating actively in scientific discussions, while evaluating the effectiveness of the communication methods used. (M17)	Tutorials, Module seminars, Laboratory classes, module design exercise supervision, Project supervision	Module presentations, Laboratory, module design exercise and Individual project report
Appraisal of evidence		
Analyse complex problems using experimental methods, project design, and engineering principles, addressing uncertainty and discussing technique limitations. (M2)	Lectures, Laboratory classes, Project supervision	Written examinations, laboratory and design exercise reports, Project reports
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.	Major project report and presentation.
Evaluate customer and user needs taking into account the wider engineering context (M5)	As above.	As above.
(b) Transferable skills		
Research skills		
Select and critically evaluate technical literature, conduct literature reviews to design experiments, laboratory skills and data analysis to solve complex problems. (M4)	Tutorials, lectures, Laboratory classes, module design exercise work, Project supervision meetings	Module design exercise reports and oral presentations, Course work, Individual project report

Communication skills		
Report writing, Scientific Communication Learning how to work and communicate in a modern industrial environment	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 (M17).	Group project, independent research, project supervision.	Written assignment, project report, group report.
Data presentation		
Apply IT, analytical methods, CAD, and statistics to model complex problems, while addressing method limitations (M3).	Project supervision meetings, course work (laboratories, module design exercises)	Seminars, Course work reports, Project reports, Module examinations
Working relationships		
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
Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance (M16).	Lecture, tutorial, group project, project supervision.	Group report, presentation, Individual report.
Managing learning		
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

Career management		
1. 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. 2. Compose a Professional Development Plan considering your strengths, development areas and motivations for your next step 3. Modify your CV to include the skills and experience you have gained through your significant experience gained in the past 12 months	On placement: Project supervision, independent research	Completion of Monthly Reflective Journals to record skills development, major achievements, key areas of work, learning points and challenges overcome. 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. 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.

10. Special features

This programme is accredited by the Institution of Mechanical Engineers (IMechE) and The Institution of Engineering and Technology (IET) and is 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	Research-briefed This programme integrates the latest research findings and technological advancements directly into teaching. Academics bring their research into the curriculum, allowing students to engage with developments in embedded systems and control engineering. Case studies and research papers are explored to bridge

the curriculum.	theoretical knowledge with real-world applications, ensuring that students gain insights from cutting-edge discoveries and innovations in the field.
Research-based Framed enquiry for exploring existing knowledge.	Research-based Students engage in problem-based learning, group projects, and practical laboratories designed to develop their intellectual curiosity. Through structured enquiries, they investigate existing research and technological challenges in embedded systems and control engineering. This approach promotes skills in experimental design, contextual analysis, and critical evaluation of findings, enabling students to effectively apply theoretical principles to practical scenarios.
Research-oriented Students critique published research content and process.	Research-oriented The programme encourages students to critically assess published research, examining methodologies, results, and conclusions within the field. Through coursework and assessments, they learn to analyse academic literature, identify gaps in knowledge, and evaluate the validity and impact of research studies. By engaging in scientific discussions and comparing various research perspectives, students develop a deeper understanding of the strengths and limitations of existing work.
Research-apprenticed Experiencing the research process and methods; building new knowledge.	Research-apprenticed Under academic mentorship, students participate in research-driven projects, gaining experience in all stages of the research process—from setting objectives to data analysis and presenting results. The programme places a strong emphasis on practical skills, optimisation, and modelling. Students also develop empirical and computational capabilities through assessments and workshops. Training in report writing, teamwork, literature reviews, and communication ensures that graduates are well-prepared to present their findings through reports, posters, and oral presentations. This hands-on experience prepares students for both academic and professional careers, equipping them with essential problem-solving and collaborative skills.

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:

The MSc Embedded Systems and Control Engineering programme at the University of Leicester offers students unique opportunities to engage with the vibrant research culture of the School of Engineering. Students can attend bi-monthly seminars where guest speakers, including researchers, academics, and industry experts, share insights on the latest innovations and real-world challenges. These seminars provide networking opportunities and a multidisciplinary perspective on emerging engineering trends. Additionally, individual and group projects, co-designed by students, are closely aligned with the ongoing research within the School's five distinct groups. This involvement allows students to contribute to the research culture, deepening their understanding of the field and preparing them for future careers.

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 MSc Embedded Systems and Control Engineering programme delivers research-informed teaching through modules like Embedded Systems, Real-Time Simulation Projects, and Control Research Inquiry-Based Teaching. These integrate foundational and advanced topics such as high-reliability systems, monitoring and control, Industry 4.0 simulation, signal processing, and

advanced techniques like robust and nonlinear control. This equips students with theoretical knowledge and industry-relevant skills to tackle real-world challenges.
The research-informed pedagogy of the programme is supported by the School's commitment to teaching excellence. Best practices are shared through teaching away days, peer observations, and university-wide teaching and learning conferences. 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.

Regular discussions in the Education Committee and meetings between education and programme directors ensure continuous improvement, providing students with a cutting-edge and comprehensive learning experience.

11. Indicators of programme quality

The programme is subject to all normal school, 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.
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- 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 a PG Diploma in Embedded Systems and Control Engineering 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.

As defined in Senate Regulation 6: Regulations governing taught postgraduate programmes of study.
The following additional progression 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)

None

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.

Credit breakdown

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

180 credits in total

Level 7/Year 1-September intake 2026/27

Core modules

Delivery period	Code	Title	Credits
Semester 1	EG7010	Engineering Design Case Study	15 credits
Semester 1	EG7014	High Reliability Embedded Systems	15 credits
Semester 1	EG7042	Robust Control	15 credits
Semester 1	EG7044	Nonlinear Control	15 credits
Semester 2	EG7231	Real time simulation for industry 4.0	15 credits

Semester 2	EG7324	Signal Processing	15 credits
Semester 2	EG7018	Embedded Systems for Condition Monitoring and Control	15 credits
Semester 2	EG7035	Advanced Electronically Controlled Drives	15 credits

Notes
1. The 'with industry' programme includes an industrial placement following the end of the final exam period in the taught phase, Placement Students will return to the University to complete the project/dissertation after the industrial placement.

Level 7/Summer

Core modules

Delivery period	Code	Title	Credits
Summer	EG7020	Individual Project	60 credits

Level 7/Year 1- January intake 2026/27

Core modules

Notes
Please note that for January intake students Semester 2 will be first, followed by Semester 1.

The 'with industry' programme includes an industrial placement following the end of the final exam period in the taught phase, Placement Students will return to the University to complete the project/dissertation after the industrial placement.

Level 7/January 2027

Core modules

Delivery period	Code	Title	Credits
Semester 2	EG7231	Real time simulation for industry 4.0	15 credits
Semester 2	EG7324	Signal Processing	15 credits
Semester 2	EG7018	Embedded Systems for Condition Monitoring and Control	15 credits
Semester 2	EG7035	Advanced Electronically Controlled Drives	15 credits

Semester 1	EG7010	Engineering Design Case Study	15 credits
Semester 1	EG7014	High Reliability Embedded Systems	15 credits
Semester 1	EG7042	Robust Control	15 credits
Semester 1	EG7044	Nonlinear Control	15 credits

Delivery period	**Code**	**Title**	**Credits**
January	EG7020	Individual Project	60 credits

Appendix 2: Module specifications

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