Programme Specification (Undergraduate) FOR ENTRY YEAR: 2024/25

Date created: 12/06/2023 **Last amended:** 30/01/2025 **Version no.** 2 **Date approved by EQED:** n/a

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

MEng Electrical and Electronic Engineering

MEng Electrical and Electronic Engineering with a Year in Industry

MEng Electrical and Electronic Engineering with a Year Abroad

BEng Electrical and Electronic Engineering

BEng Electrical and Electronic Engineering with a Year in Industry

BEng Electrical and Electronic Engineering with a Year Abroad

Dip HE Electrical and Electronic Engineering*

Cert HE Electrical and Electronic Engineering*

Notes

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

a) HECOS Code

HECOS Code	%
100163	100

b) UCAS Code (where required)

Variant	UCAS code	Engineering Council ACAD
MEng (4yrs)	H606	1459
MEng with industry (5yrs)	H607	5512
MEng with Year Abroad (5yrs)	H603	9863
BEng (3yrs)	H604	1450
BEng with industry (4yrs)	H609	NEW TBC
BEng with Year Abroad (4yrs)	H600	9860

There is a foundation year option nominally for the General Engineering programme (H199) which gives students the option to switch to the other programmes.

2. Awarding body or institution:

University of Leicester

3. a) Mode of study

Full-time

b) Type of study

Campus-based

4. Registration periods:

MEng, Master of Engineering
Full-time
The normal period of registration is four years
The maximum period of registration is six years

BEng, Bachelor of Engineering
Full-time
The normal period of registration is three years
The maximum period of registration is five years

The 'with a Year in Industry' and 'with a Year Abroad' options of each degree would add one year to the normal and maximum periods of registration listed above.

For Foundation Year Variant:
The normal period of registration is four years (one year for the Foundation Year, with three years for the BEng)
The maximum period of registration is six years (one year for the Foundation Year, and five years for the BEng)

5. Typical entry requirements

The ability to benefit from the University of Leicester programmes is assessed on a combination of academic and personal qualities, which can be demonstrated in a number of ways.

The following standard entry requirements are shown for guidance.

MEng. Typical offer:
A/AS-levels: BBB including Maths. Two AS-levels considered in place of one A-level. General Studies accepted..
EPQ with A-levels: BBC + EPQ at grade B. A-level subjects to include Maths.

BEng. Typical offer:
A/AS-levels: BBB including Maths. Two AS-levels considered in place of one A-level. General Studies accepted.
EPQ with A-levels: BBC + EPQ at grade B. A-level subjects to include Maths.

Successful completion of a GCE or VCE Advanced level course of study (or some other equivalent qualification) is just one way. However, there are many other ways to demonstrate the ability to benefit from a University of Leicester programme. For example, students could be evaluated based on their prior work experience, their extracurricular activities, or their community involvement. These are all indicators of a student's potential to succeed in a university setting.

Furthermore, the University of Leicester recognizes that not all applicants have had the opportunity to pursue formal education, and that many students may have gained valuable skills and knowledge through alternative means. Therefore, mature students without formal qualifications will always be considered and are encouraged to contact the admissions tutor to discuss their application.

Applicants should use the personal statement on their application to illustrate their abilities, aptitudes, skills, qualifications, and experiences which might be taken into account, as well as or instead of any of the formal qualifications listed above. This is an opportunity for applicants to showcase their unique backgrounds and experiences, and to demonstrate how they have developed the skills and knowledge necessary to succeed at the University of Leicester. It is University policy to recognize a wide variety of evidence, and potential applicants may wish to discuss this aspect of their application with the admission tutor to ensure that they are presenting the most comprehensive and compelling case possible.

6. Accreditation of Prior Learning

APL will not be accepted for exemptions from individual modules.

For Foundation Year Variant:

n/a

7. Programme aims

All the variants of the programme aim to

- Produce graduates of Electrical and Electronic Engineering with the necessary skills and attributes to take roles within industry as Professional Engineers and provide the educational basis to facilitate progression to Chartered Status.
- Produce graduates who can apply science, mathematics and engineering principles and techniques to produce creative and innovative solutions to engineering problems.
- Allow graduates to apply engineering concepts and tools to analyse, model and solve complex problems.

- Equip students with an awareness of engineering in the wider economic, social and environment context and minimise adverse effect for the design of economically viable product or process.

- Offer a challenging programme, which is current, relevant, and informed by staff research, consultancy, and professional experience.
- Provide wide opportunities for access, consistent with Professional Body requirements.

It provides a solid foundation in the principles of Electrical and Electronic Engineering and will satisfy the required overall standard and criteria of the accrediting engineering institutions. These are based on the learning outcomes taken from the UK Standard for Professional Engineering Competence and Commitment (UK-SPEC), the Engineering Council's Approval and Accreditation of Qualifications and Apprenticeships (AAQA), and Accreditation of Higher Education Programmes (AHEP). These are defined in 5 overarching outcomes:

- Science and Mathematics (SM),
- Engineering Analysis (EA),
- Design and Innovation (DI),
- The Engineer and Society (EL)
- Engineering Practice (P)

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 outcomes is divided into a maximum of 16 specific outcomes (e.g. a(i) – a(iii), b(i)-b(vii) and c(i)-c(vi)) that contributes to the achievement of AHEP learning outcomes.

These are mapped to module-level Intended Learning Outcomes and assessment elements, and are detailed in the module specifications.

The BEng programmes aim to:

1. provide students with the breadth of understanding in relevant science and mathematics to allow analysis and design of Electronic and Electrical Engineering systems that improve quality of life through being able to integrate knowledge from other engineering disciplines.
2. develop students' knowledge and understanding of the computational tools and techniques used for modelling, analysis, design and control of complex Electronic and Electrical engineering systems.
3. develop students' integrated, system thinking across multiple technical and non-technical disciplines in research and the electrical power, electronics, and communications industry;
4. Value curiosity, creativity, collaboration and analysis as keystones in the creation of new knowledge and practice; and
5. foster students' awareness of sustainability, ethics, risk and the importance of equity, diversity and inclusion.
6. Combine all the above to support their independent learning, organisational skills and draw students towards a career in the engineering profession.

Additionally, the MEng programmes aim to meet the conditions of the appropriate professional institutions and satisfy the educational requirements for registration by the Engineering Council at CEng level. The MEng programmes aim to develop greater depth and breadth of knowledge and the ability to apply methods critically and in ambiguous situations, to optimise new and developing Electronics and Electrical Engineering technology, to identify projects and technical potential and to lead engineering activities and teams by managing technical and commercial risks and through change.

In addition, the 'Year Abroad' variant of this programme is offered in accordance with the University's standard specification for the experiential year abroad variant and these additional programme aims apply:

- provide students with the opportunity to spend one year studying out of the UK to gain an international perspective on their discipline, experience living and study in a different culture, and possibly improve their language skills.

In addition, the 'Year in industry' variant of this programme is offered in accordance with the University's standard specification for year in industry programme variants and these additional programme aims apply:

- provide experience of applications of professional and discipline-specific skills in Industry and to reinforce knowledge through its use in different environments.
- 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 Subject Benchmarking Statement - Engineering
- The Framework for Higher Education Qualifications of UK Degree-Awarding Bodies (FHEQ)

- Annex D: Outcome classification descriptions for FHEQ Level 6 (Level 7 for MEng) and FQHEIS Level 10 (Level 11 for MEng) degrees
- 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 UK-SPEC (The UK Standard for Professional Engineering Competence and Commitment), fourth edition published in August 2020, for implementation by 31 December 2021
- Approval and Accreditation of Qualifications and Apprenticeships (AAQA 1st Edition published in August 2020)
- Accreditation of Higher Education Programmes (AHEP 4th Edition published in August 2020)
- Engineering Council Compensation and Condonement Policy (published in November 2021).
- Engineering Accreditation Board (EAB) Accreditation Briefing Manual for Education Institutions (for the use with AHEP 4.0)
- Regulations for Registration (RfR).

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9. Programme Outcomes

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

a) Knowledge and Critical Understanding

i) Competence in an appropriate body of knowledge

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Demonstrate knowledge of the scientific and mathematical principles and techniques necessary for a well-rounded Electronics & Electrical Engineer, including analogue and digital electronics, electrical power, communications and embedded systems (SM).	Lectures, tutorials, seminars, laboratory practicals, directed reading, independent research, resource-based learning are used to deliver the ILOs.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Examinations (both open-book and closed-book), laboratory reports, verbal seminar presentations, peer and self-assessment (e.g. contributions to discussions, group projects, etc), problem-based exercises, design tasks, simulation exercises, project reports (e.g. group projects, independent projects).
Students should be able to: [MEng only] Demonstrate a comprehensive knowledge of current and developing scientific and	Lectures, tutorials, seminars, laboratory practicals, directed reading, independent research, resource-based learning.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation

mathematical principles in Electronic and Electrical Engineering and related disciplines, and informed by a critical awareness of new developments and the wider context of engineering including specific advanced level knowledge in areas that could include control systems, advanced motor drives and communications (SM).		further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	exercises, group projects, independent projects.

ii) Breadth of knowledge

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Demonstrate knowledge, understanding and application of appropriate mathematical, computational techniques and scientific principles and methods for modelling and analysing Electronic, Electrical and related engineering problems (SM, EA).	Lectures, tutorials, surgeries problem solving classes computer practical classes, example sheets.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.

		peers and enhances learning and research capabilities.	
Students should be able to: Demonstrate knowledge and understanding of the design process and design methodologies used in the discipline (D).	Lectures, tutorials, surgeries problem solving classes, independent research, project supervision	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Students should be able to: Demonstrate knowledge and understanding of management, business practices and industrial standards that influence an engineer's work (EL).	Lectures, tutorials, independent research, project supervision, work placement.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Students should be able to: Demonstrate knowledge and understanding of manufacturing and/or operational practice (P).	Lectures, tutorials, independent research, project supervision.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Students should be able to: [MEng only] Apply knowledge and techniques critically with potential ambiguous, novel and/or changing and developing situations and technologies (EA, D, EL, P).	Lectures, independent research, major projects.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Students should be able to: Work as an engineer in an industrial [with Industry] or international setting [with Year Abroad] (G)	Work/International placement	Same as the above.	Work placement report/International Year Assessments.

iii) Understanding of source materials

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to:	Lectures, tutorials, surgeries problem solving classes	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and	Examinations, laboratory reports, seminar presentations, contributions to discussions,

Apply scientific principles to model and analyse engineering systems, processes and products (SM).	computer practical classes, example sheets.	explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Students should be able to: Demonstrate knowledge of characteristics of particular equipment, processes or products, based upon a broad knowledge and understanding of engineering materials and, recognising their limitations. (SM, P).	Lectures, tutorials, surgeries problem solving classes computer practical classes, example sheets.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Students should be able to: Select and evaluate technical literature and other sources of information to generate a sound grasp of the commercial context of their work (EL, P).	Lectures, tutorials, surgeries problem solving classes computer practical classes, example sheets.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.

Analyse systems, processes or components as part of the design process (D).	Lectures, tutorials, surgeries problem solving classes computer practical classes, example sheets.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Awareness of statistical methods to handle uncertainty (SM).	Lectures, tutorials, surgeries problem solving classes computer practical classes, example sheets.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Evaluate commercial risks and technical risks (EL) including [MEng only] in unfamiliar circumstances	Problem solving exercises, independent research projects, group projects.	Same as the above.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.

b) Cognitive and Practical Skills

i) Selection and analysis of sources

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Select, evaluate and comment on reading, research and primary sources	Design task and research projects.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems,	Major research and design project reports and presentations.

		recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	
Students should be able to: Evaluate customer and user needs taking into account the wider engineering context (D)	Design tasks, laboratory practicals, simulation exercises, group projects, work placement	Same as the above.	Problem solving exercises, simulations, exhibitions, independent research.
Students should be able to: Create and design new processes or products to fulfil a specified requirement through synthesis of ideas from a wide range of sources (D).	Design tasks, laboratory practicals, simulation exercises, group projects, work placement	Same as the above.	Problem solving exercises, simulations, exhibitions, independent research.
Students should be able to: [MEng only] use pertinent data and methods, including original research, to tackle problems with ambiguity, involving incomplete data and new technology (EA, D).	Design task and research projects.	Same as the above.	Major research and design project reports and presentations.

ii) Critical engagement

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Function effectively as an individual, and as a member or leader of a team throughout their work, including group work and placements [SM, EL, P].	Lectures, tutorials, independent research, project supervision, work placement.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects, peer and self-assessment.

		enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	
Students should be able to: Demonstrate creativity in solutions for complex problems [MEng only] that evidence some originality, whilst considering safety, societal, environmental and codes of practice and industry standards [D]	Design task and research projects.	Same as the above.	Major research and design project reports and presentations.

iii) Presentation of an argument

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Interpret and report results, presenting data in alternative forms suitable for a range of different audiences in order to create deeper understanding and/or greater impact (D, P).	Lectures, seminars, masterclasses.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments	Written assignments, exhibitions, poster displays, literature reviews, reports, independent research projects, peer and self-assessment

		will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	
Students should be able to: Communicate effectively on information, ideas, problems and solutions verbally, electronically and in writing with technical and non-technical audiences, [MEng only] evaluating the effectiveness of the methods used. (EL, D, P).	Design tasks, laboratory practicals, simulation exercises, group projects, work placement	Same as the above.	Problem solving exercises, simulations, exhibitions, independent research.

iv) Independent research

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Use standard and specialist engineering IT software confidently to conduct and report on engineering analysis and projects (D, P).	Lectures, group projects, independent research, project supervision.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Written assignments, laboratory reports, essays, independent project reports.

Students should be able to: demonstrated ability to conduct investigations or practical tasks autonomously and to reflect critically and independently (SM, P)	Lectures, group projects, independent research, project supervision.	Same as the above.	Written assignments, laboratory reports, essays, independent project reports.

v) Relevant technical skills

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Select and apply appropriate computational toolsl, analytical techniques and engineering technologies to address complex problems, recognising their limitations. (EA, P).	Laboratory practicals, group research projects, independent research projects.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Laboratory reports, examinations, projects reports.
Students should be able to: Select and apply appropriate practical laboratory and workshop skills, equipment (e.g. measurement instrumentation) and procedures to conduct experiments, [MEng only] demonstrating some original and	Laboratory practicals, design tasks, independent research.	Same as the above.	Laboratory practicals, design tasks, independent research.

innovative application of engineering practical skills [EA, P]			
Students should be able to: Apply understanding of codes of practice related to hazards and operational safety to ensure good working practices and effective risk management (EL).	Laboratory practicals, design tasks, independent research.	Same as the above.	Laboratory reports, written assignments, work placement report.
Students should be able to: [BSc, DipHE, CertHE only] Demonstrate partial achievement of the full set of Engineering Council learning outcomes by meeting the University award criteria, whilst falling short of demonstrating the more stringent minimum requirements specified by the Engineering Council.	All teaching and learning methods detailed above.	Same as the above.	Assessments common with BEng/MEng programmes but with failures in individual modules.

vi) Autonomous working

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Demonstrate self-direction and some originality in tackling and solving problem and act autonomously in planning and implementing tasks [D, P].	Laboratory practicals, design tasks, independent research.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments	Laboratory practicals, design tasks, independent research.

		will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	
Students should be able to: [MEng only] Demonstrate self-direction and evidence originality in tackling and solving problems and act autonomously in planning and implementing tasks at a professional or equivalent level [D, P] .	Laboratory practicals, design tasks, independent research.	Same as the above.	Laboratory practicals, design tasks, independent research.

vii) Presentation of research findings

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Communicate and interpret information (e.g. technical literature and other sources of information) in an integrated manner to both specialist and non-specialist [D, P].	Laboratory practicals, design tasks, independent research.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Oral presentations, Laboratory practicals, design tasks, independent research.

Students should be able to: Present research findings effectively in a wide range of formats, with an appreciation of the uncertainty, ambiguity and limits of knowledge [EL, P].	Laboratory practicals, design tasks, independent research.	Same as the above.	Oral presentations, Laboratory practicals, design tasks, independent research.

c) Transferable skills

i) Verbal, written and digital communication

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Present technical and business information orally, in an appropriate form for a given audience (D).	Tutorials, group projects, independent research, project supervision.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Oral presentations, portfolio.
Students should be able to: Communicate business and technical information in an appropriate written form for a given audience (D).	Lectures, group projects, independent research, project supervision.	Same as the above.	Written assignments, laboratory reports, essays, independent project reports.

Students should be able to: Report on a practical or simulation test of a design solution including analysis and discussion of the results (D).	Lectures, group projects, independent research, project supervision.	Same as the above.	Written assignments, laboratory reports, essays, independent project reports.
Students should be able to: Use practical digital skills and specialist engineering IT software in contributions to group discussions and/or project work [EL, D].	Laboratory practicals, design tasks, independent research.	Same as the above.	Oral presentations, Laboratory practicals, design tasks, independent research.

ii) Numeracy

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Manipulate and sort data to generate new data sets (SM, EA).	Problem-solving classes, research projects.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Computer-based exercises, written assignments, poster displays, oral presentations.

Students should be able to: Manipulate and present data in alternative formats to create deeper understanding or greater impact (EA, D).	Problem-solving classes, research projects.	Same as the above.	Computer-based exercises, written assignments, poster displays, oral presentations.

iii) Self-reflection

Intended Learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Reflect their development of understanding and skills associated with a particular project or activity	Tutorials, group projects, independent research, project supervision.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Laboratory, reports, essays, independent project reports.
Students should be able to: Learn independently and understand new concepts in the discipline readily (G).	Independent research projects, group research projects, work placement.	Same as the above.	Work placement report, independent project report, learning logs/diaries, learning portfolios.
Students should be able to:	Masterclasses, learning portfolios, work placement.	Same as the above.	Learning portfolios

Explore career development opportunities (G).			

iv) Problem solving

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Solve problems through the integration of knowledge of mathematics, science, information technology, design, business context and engineering practice (SM, EA).	Project supervision, lectures, tutorials, example sheets, simulation exercises, laboratory based exercises, computer- based exercises, independent research projects, group projects.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Individual research projects, oral presentations, project reports, problem-based examinations, practical demonstrations.
Students should be able to: Select and analyse appropriate evidence to solve non-routine problems (EA, D).		Same as the above.	
Students should be able to: Use systematic analysis and design methods to solve problems in unfamiliar situations (D).		Same as the above.	
Students should be able to:		Same as the above.	

Use creativity and innovation to solve problems (D).			
Students should be able to: Apply standard management techniques to plan and allocate resources to projects (EL).		Same as the above.	

v) Organisation and management

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Develop and implement personal plan of work to meet a deadline and identify the critical activities (G).	Independent research projects, group research projects, work placement.	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Work placement report, independent project report, learning logs/diaries, learning portfolios.
Students should be able to: Exercise initiative and personal responsibility, which may be as a team member or as a leader (P, G).	Independent research projects, group research projects, work placement.	Same as the above.	Work placement report, independent project report, learning logs/diaries, learning portfolios.

Demonstrate knowledge and understanding of the professional and ethical conduct of an engineer and legal requirements (EL)	Work placement, simulation exercises, independent research	Same as the above.	Work placement report, simulation exercises, reports, independent projects.

vi) Teamwork

Intended learning Outcome	Teaching methods	Learning Activities	Assessment Type
Students should be able to: Work collaboratively as part of an engineering team undertaking a range of different team roles (P).	Tutorials, masterclasses, project supervision, induction programmes	Each module has three hours of weekly lecturing or workshop contact to increase knowledge and explore current technologies. Materials for students review and further studies are provided through the online and digital education experience. Lecture material is also enhanced during laboratory and workshop sessions, allowing demonstration of theories and approaches to complex problems, recognising the limitations of the methods employed. Worked examples of summative assessments will be provided for discussion with academic staff and to explore alternatives. Cross-disciplinary group work and projects allow exposure to peers and enhances learning and research capabilities.	Learning logs/diaries, learning portfolios, group projects, simulation exercises.
Students should be able to: [MEng only] Lead engineering activities and teams by managing technical and commercial risks, including through change (P).	Major design and research projects.	Same as the above.	Reports, design reviews and presentations.

Year Abroad

In addition, for the ‘with a Year abroad’ variants the additional programme outcomes apply.

Year in Industry

In addition, for the with a Year in Industry variant the additional programme outcomes apply.

10. Progression points

This programme follows the standard Scheme of Progression set out in Senate Regulations – see the version of Senate Regulation 5 governing undergraduate programmes relevant to the year of entry.

The following additional progression requirements for this programme have been approved by the Quality and Standards Sub Committee on dd/mm/2023:

- For Foundation Year Variant: Reference should be made to the Foundation Year Programme Specification. The progression routes from STEM foundation to further study are a key feature and selling point of the SoE's foundation programmes. We adopt the same pathway as other SoE's programmes to clearly motivate prospective students. The curriculum in the foundation year is closely aligned with the needs of the EEE programme it feeds into. This integrated foundation year, seamlessly linked to an EEE undergraduate degree, facilitates smooth progression for students. Close collaboration on curriculum and admissions between foundation and the EEE programme ensures efficient student progression. Qualified candidates can register for MEng/BEng degrees. Additional exit award routes are provided for students who do not meet the progression criteria.
- EG2006 is not available for reassessment by repeating 'real-time' activities except at the discretion of the Board of Examiners who may ask students to resubmit one or more assessment elements where it is possible for students to achieve a pass mark for the module by improving their mark in individual elements.
- Major individual or group projects modules and/or those covering AHEP learning outcomes that are not assessed in other modules are designated as being required to be passed at Honours level and cannot be treated as compensated fails for progression. These are indicated in the relevant module specifications: EG2004 and EG2006.
- No failed credits (i.e. those for which assessment opportunities have been exhausted) may be carried from 1st year (level 4) to 2nd year (level 5), or from 2nd year (level 5) to 3rd year (level 6) because this would prevent students from being eligible for the award of an accredited degree at the end of their 3rd or 4th year. For accreditation purposes, the Engineering Council requires that finalists on accredited BEng and MEng programmes:

  1. Must have no more than 30 credits of "compensated fail" in levels 4-6 (BEng) or levels 4-7 (MEng). Compensated fails must have marks no lower than 35% in levels 4-6 or 40% at level 7.

  2. Must not have any failed modules in levels 4-6 (BEng) or levels 4-7 (MEng) with marks below the "compensated fail" level.

  Finalists who do not meet both these criteria will be permitted one further attempt to resit any failed modules for which they have remaining attempts. If after resit they do not achieve the requirements above but do meet the University's criteria for the award of a bachelor's degree, they will be awarded the non-accredited degree of BSc in Electrical and Electronic Engineering.

- For MEng students, in addition to the standard regulations governing undergraduate programmes, for progression from 2nd year to 3rd year a credit weighted average mark of 55% or more is required. Failure to progress will result in a change in programme from MEng

to the equivalent BEng programme. Third year BEng students with a 2nd year credit-weighted average below 55% will not be permitted to transfer to an MEng programme during their 3rd year. Third year BEng students with a 2nd year credit-weighted average of 55% and above may be permitted to transfer to an MEng programme.

- For MEng students, in addition to the standard regulations governing undergraduate programmes, for progression from 3rd year to 4th year, a credit weighted average of 55% or more is required and EG3005 and EG3008 must be passed at Honours level. Candidates who do not meet these criteria will be considered for the award of a BEng or non-accredited BSc degree in their discipline, after one further resit attempt for any failed modules if necessary.

The following additional progression requirements apply for the with Industry version of the programme:

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

1. They fail to secure a year in industry role.
2. They fail to pass the assessment related to the year in industry.
3. The year in industry 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 suspend for the remainder of the academic year. To prevent such an incident from happening, processes are in place to identify any possible issues or concerns early in the year in industry 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.
4. They discontinue their Year in Industry. A student can return to their campus-based studies no later than the end of teaching week 2 at the start of the academic year should they decide to discontinue their Year in Industry they should complete a Course Transfer From. If a Placement Student decides to discontinue their Year in Industry after this point they will need to suspend their studies for the remainder of the academic year.

Nine months is the minimum time required for a year in industry to be formally recognised. If the year in industry is terminated earlier than 9 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 1 – 6 months, they will be supported to search for another placement to take them up to the 9 months required for the year in industry to be formally recognised. If the Placement Student does not find a placement to meet this criterion they will be required to suspend and transferred onto the degree without Year in Industry.
2. If the Placement Student has completed 7-8 months, they will be supported to search for another placement to take them up to the 9 months required for the year in industry to be formally recognised. If the Placement Student cannot source an additional placement to take them to 9 months, assessments related to the year in industry will be set for the student to make it possible for the individual learning objectives for the year in industry to be met. This will allow the Year in Industry to be recognised in the degree certificate.

A Placement Student will not be permitted to undertake a placement which runs across two academic years.

In cases where a student has failed to meet a requirement to progress, he or she will be required to withdraw from the course.

a) Course transfers

Students who do not achieve the standard required for MEng, including those who have an average 2nd year mark of less than 55%, will be transferred to the BEng degree course.

b) Year abroad

For the Year Abroad variant (for experiential Year Abroad only) the additional progression points apply

c) Year in Industry

For the Year in Industry variant, the additional progression points apply

11. Criteria for award and classification

This programme follows the standard scheme of undergraduate award and classification set out in Senate Regulations – see the version of *Senate Regulation 5 governing undergraduate programmes* relevant to the year of entry.

The following additional award requirements for this programme have been approved by the Quality and Standards Sub Committee on Click or tap to enter a date.:

- Major individual or group project modules and/or those covering AHEP learning outcomes that are not assessed in other modules are designated as being required to be passed at Honours level. Students cannot be condoned by being treated as compensated fails for the purpose of accredited award. For BEng this is EG3005. For MEng these are EG4007 and EG4009.
- EG4007 and EG4009 are not available for reassessment by repeating 'real-time' activities except at the discretion of the Board of Examiners who may ask students to resubmit one or more assessment elements where it is possible for students to achieve a pass mark for the module by improving their mark in individual elements.
- For accreditation purposes, the Engineering Council requires that finalists on accredited BEng and MEng programmes:
  1. Must have no more than 30 credits of "compensated fail" in levels 4-6 (BEng) or levels 4-7 (MEng). Compensated fails must have marks no lower than 35% in levels 4-6 or 40% at level 7.
  2. Must not have any failed modules in levels 4-6 (BEng) or levels 4-7 (MEng) with marks below the "compensated fail" level.

  Finalists who do not meet both these criteria will be permitted one further attempt to resit any failed modules for which they have remaining attempts. If after resit they do not achieve the requirements above but do meet the University's criteria for the award of a bachelor's degree, they will be awarded the non-accredited degree of BSc in Electronic & Electrical Engineering.

12. Special features

The four undergraduate degree streams of Aerospace, Mechanical, Electrical & Electronic and General are highly integrated. This derives from the General Engineering ethos of the School, ensures all engineering students benefit from a solid foundation in the fundamentals of all engineering disciplines. This feature is used to maximise opportunities for interdisciplinary working and integrated projects teams that are so important to modern professional engineering careers.

For the Year Abroad variant (for experiential Year Abroad only) the additional Special Features apply

Students receive a broad education in engineering which also provides the flexibility for more specialist focus later in the degree. Opportunities are available to undertake industrial placement

with a sponsoring company (with Industry). Students following "with a Year Abroad" programmes study for year out of the UK. The year abroad does not replace any of the Leicester course material, rather it provides an opportunity for the students to broaden their experience.

For the Year in Industry variant, the additional Special Features apply.

For students on the with Industry programme, it is the student's responsibility to secure a year in industry role. Employer led activities provide a platform for students to engage with organisations who are recruiting students for year in industry roles. When a Placement Student starts a year in industry, 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.

13. Indications of programme quality

Normal University academic quality assurance processes are used to continuously review and improve the programmes.

All of the current programmes within the School of Engineering are accredited by the appropriate professional engineering institutions (PEIs), through the Institution of Mechanical Engineers (IMechE), Institution of Engineering and Technology (IET) and Institute of Measurement and Control (InstMC), which leads to an advantage when applying for professional registration as a Chartered Engineer (CEng). The current MEng programmes offer direct route to Chartered Engineer status (CEng) (further learning following graduation is required to obtain CEng with a BEng degree).

The School keeps the professional engineering institutions whom we seek accreditation from under review and the 5 yearly accreditation visits are key events in continuously improving the programmes and evolving them to meet the needs of future graduates and employers.

Accreditation process to the programme is underway through Institution of Engineering and Technology (IET).
Revisions to the programme and module ILOs, and the introduction of new Engineering Council criteria for awarding accredited degrees were implemented in the latest revision of these programmes in response to the accreditation visit in December 2018

14. External Examiner(s) 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 (Undergraduate) FOR ENTRY YEAR: 2024/25

Date created: 12/06/2023 **Last amended:** 30/01/2025 **Version no.** 2 **Date approved by EQED:** n/a

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.

BEng/MEng Electrical and Electronic Engineering

All awards of the University are made on the basis of the accumulation of credit as detailed below, in accordance with the requirements of the national Framework of Higher Education Qualifications (FHEQ). 120 credits is undertaken at each level of study which is normally split equally between two semesters. Any variation from this will be approved by the Quality and Standards Sub-Committee on the recommendation of the relevant Programme Approval Panel. Students must take the stated number of credits but an award may be made with a specified number of failed credits in accordance with the relevant scheme of assessment below.

Level 4/Year 1 2024/25

Credit breakdown

Status	Year long	Semester 1	Semester 2
Core	30 credits	45 credits	45 credits
Optional	n/a	n/a	n/a

120 credits in total

Core modules

Delivery period	Code	Title	Credits
Year long	EG1007	Sustainable Engineering Design	15 credits

Delivery period	Code	Title	Credits
Year long	EG1122	Digital Electronics and Communications	15 credits
Semester 1	EG1203	Principles of Electrical Engineering	15 credits
Semester 1	EG1016	Engineering Mathematics with programming - I	15 credits
Semester 1	EG1031	Solid Mechanics	15 credits
Semester 2	EG1041	Fluid Mechanics	15 credits
Semester 2	EG1026	Engineering Mathematics with programming - II	15 credits
Semester 2	EG1102	Thermodynamics and Heat Transfer	15 credits

Notes
n/a

Notes
n/a

Level 5/Year 2 2025/26

Credit breakdown

Status	Year long	Semester 1	Semester 2
Core	30 credits	30 credits	30 credits
Optional	n/a	15 credits	15 credits

120 credits in total

Core modules

Delivery period	Code	Title	Credits
Year long	EG2302	System Dynamics and Control	15 credits
Year long	EG2BBB*	Integrated Engineering Design	15 credits

Delivery period	Code	Title	Credits
Semester 1	EG2211	Analogue Electronics and Amplifiers	15 credits
Semester 2	EG2232	Signals and Systems	15 credits
Semester 1	EG2AAA*	Engineering Management and Business Simulation	15 credits
Semester 2	EG2201	Electronics Test and Instrumentation	15 credits

Notes
EG2AAA* Engineering Management with Business Simulation (15) in Semester 1 and EG2BBB* Integrated Engineering Design (15) Year-long are to replace EG2006 from AY24-25 onwards (subject to the University approval)

Option modules

Delivery period	Code	Title	Credits
Semester 1	EG2213	Mechatronics	15 credits
Semester 1	EG2231	Embedded Systems and IoT	15 credits
Semester 2	EG2213	Computing Engineering Method	15 credits
Semester 2	EG2212	Electric Machines and Drives	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.

Level 6/Year 3 2026/27

Credit breakdown

Status	Year long	Semester 1	Semester 2
Core	30 credits	n/a	n/a
Optional	n/a	45 credits	45 credits

120 credits in total

Core modules

Delivery period	Code	Title	Credits
Year long	EG3005	Individual Project	30 credits

Notes

For general EEE students, students choose three 15-credit optional modules for each semester of Level 6/Year 3.

For students under Stream I, II or III pathway, students have one 15-credit stream-specific core module in each semester, and choose two 15-credit optional modules for each semester of Level 6/Year 3.

Option modules

Delivery period	Code	Title	Credits
Semester 1	EG3313	State Variable Control	15 credits
Semester 1	EG3224	Sustainable Electrical Systems	15 credits
Semester 1	EG3323	Digital Control and Actuators	15 credits
Semester 1	EG3212	Power Electronics	15 credits
Semester 1	EG3231	Real-time Cyber-Physical System Design	15 credits
Semester 2	EG3211	Analogue and Digital Communications	15 credits
Semester 2	EG3213	Machine Learning for Engineers	15 credits
Semester 2	EG3232	Digital System Design and Programming	15 credits
Semester 2	EG3421	Flight Dynamics, Control and Avionics	15 credits
Semester 2	EG3221	National Grid Design and Operation	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.

Level 7/Year 4 2027/28

Credit breakdown

Status	Year long	Semester 1	Semester 2
Core	60 credits	n/a	n/a
Optional	n/a	30 credits	30 credits

120 credits in total

Core modules

Delivery period	Code	Title	Credits
Year long	EG4007	Group Project	30 credits
Year long	EG4009	Leadership and Project Management	15 credits
Year long	EG4201	Systems Reliability and Sustainability	15 credits

Notes

For general EEE students, students choose two 15-credit optional modules for each semester of Level 7/Year 4.

For students under Stream I, II or III pathway, students have one 15-credit stream-specific core module in each semester, and choose one 15-credit optional modules for each semester of Level 7/Year 4.

Option modules

Delivery period	Code	Title	Credits
Semester 1	EG4313	Rotorcraft Mechanics and Control	15 credits
Semester 1	EG4211	Advanced Electrical Machines	15 credits
Semester 1	EG4227	Artificial Intelligence Architectures	15 credits
Semester 1	EG4212	Hybrid and Electric Propulsion Systems	15 credits
Semester 1	EG4413	Spacecraft Systems Engineering	15 credits

Delivery period	Code	Title	Credits
Semester 2	EG4323	Attitude & Orbit Control Systems	15 credits
Semester 2	EG4324	Signal Processing	15 credits
Semester 2	EG4221	Electronically Controlled Drives	15 credits
Semester 2	EG4217	Spacecraft Communication	15 credits
Semester 2	EG4231	Real-time Simulation for Industry 4.0	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.

Appendix 2: Module specifications

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