



Programme Specification

ENG-EE-2020: Engineering (Electrical and Electronic Engineering)

LU Bachelor of Engineering with Honours awarded by Lancaster University (FHEQ Level 6)

Programme Status: Approved | Version: 1

Introduction

This programme specification provides a summary of the main features of the Engineering (Electrical and Electronic Engineering) programme and the learning outcomes that you as a student might reasonably be expected to achieve and demonstrate on successful completion of the programme.

Further detailed information related to this programme and the College can be found in the following resources:

- Programme Handbook
- B&FC Student Handbook
- B&FC Admissions Policy
- Work based and placement learning handbook (for foundation degrees)
- Student guide to assessment and feedback

Key Programme Information

Programme Code	ENG-EE-2020
Programme Title	Engineering (Electrical and Electronic Engineering)
Teaching Institution	Blackpool and The Fylde College
Professional, Statutory and Regulatory Body (PSRB) Accreditation	None
UCAS Code	
Language of Study	English
Version	1
Approval Status	Approved
Approval Date	19 May 2020
JACS Code	Other: Other
Programme Leader	Margarita Georgieva

Programme Awards

Award	Award Type	Level	Awarding Body
LU Bachelor of Engineering with Honours	Honours Degree (360 credits)	Level 6	Lancaster University

Programme Overview

Electrical and Electronic engineering is one of the oldest engineering disciplines in the world, and has been responsible for most technological advances science has made. This field of engineering deals with the real-world applications of electricity, electronics and electromagnetism. In recent years it has been increasingly oriented towards fields such as IT and computing, embedded systems, robotics, high tech, and energy to achieve optimization, simplicity and reliability for the new devices of the 21st century.

Our BEng (Hons) Electrical and Electronic Engineering programme takes into account the changing face of engineering and will provide you with a modernised set of modules. The programme consists of core common modules at Level 4 such as engineering mathematics and science, computer-aided design and professional engineering management.

After you have mastered these grounding subjects, you will explore advanced, practical subject topics such as microprocessors and microcontrollers, control and simulation, embedded

systems, digital signal and image processing. Embedded within the modules are hands-on learning opportunities and many innovative activities in a blend of practical and theoretical experiences to enhance employability.

Electrical and Electronic Engineering is a grounding, foundational specialism which adapts easily to many engineering areas and works very well for those interested in technology and innovation. It also is adaptable to numerous areas of the industry and engineers in the field work well with mechanical engineers and various other technicians from the broader field of engineering. This means there are excellent career opportunities for talented engineering graduates within a variety of sectors. Many of our graduates are now employed by major companies such as EDF Energy, Westinghouse Springfields, BAE Systems, Airbus, NIC, GCE and Ford Motor Company as design, production, project or research and development engineers.

Admission Criteria

The entry criteria for Level 4 of the programme are:

- A minimum of 48 UCAS points from one of the following:
 - 2 A Levels (or equivalent), to include mathematics and a technology, engineering or science-based subject.
 - A National Certificate, Diploma or Extended Diploma (or equivalent) in a science or technology-based subject, including passes in mathematics.

The entry criteria for Level 5 of the programme are:

- HNC from B&FC for direct entry onto Level 5.
- HNC or HND, or Foundation Degree with an overall merit grade in Mechanical, General, Electrical/Electronic or Aeronautical Engineering, or another appropriate Engineering discipline through recognition of prior learning. Applicants are encouraged to apply as soon as possible to ensure timely processing of paperwork, and to investigate potential funding through the Student Loan Company if required.
- International qualification or qualification from other universities or colleges within the UK/EU might enable candidates to enter Level 5, subject to prior approval from the College's internal panel and Lancaster University.

Other Criteria

- If English is not the candidate's first language, an IELTS score of at least 6.0 with a minimum of 5.5 in all skills is also required.
- Applicants who are able to demonstrate relevant work experience or knowledge will also be considered on an individual basis and will be invited for an interview to determine suitability.
- Applicants with any other qualifications will also be considered on an individual basis, and will be invited for an interview to determine suitability.

Career Options and Progression Opportunities

The UK has a significant shortfall of suitably skilled and qualified engineers. With an electrical and electronic engineering degree, you will be a very polyvalent employee and can find work in aerospace, automotive, construction, IT, telecommunications and broadcasting, nuclear energy, design among many others. You will do very well in jobs such as management consultant, project manager, technical inspector, systems analyst. You will easily collaborate with mechanical, automotive, mechatronics and industrial engineers, providing expertise in your specific domain.

The job market in this field is stable with upcoming vacancies as a generation of engineers go

into retirement between 2020 and 2025 onwards. The salaries at starting level are very good, ranging in the usual engineering salary scales, depending on skill sets and varying between companies and locations. Some international opportunities are also available. Nationally, above 98% of students are either in further study or already employed, which points to a bright future, should you choose this engineering field. Senior salaries are often double the starting ones and higher, depending on whether you have engaged in lifelong learning and professional development.

There are numerous networking opportunities in this field with the IET, IEEE and other professional organizations which you might consider joining as a member.

Successful students may also wish to continue their studies by undertaking a relevant postgraduate degree at another university institution, leading to even greater career opportunities. Studies for a Master or research qualification can take you either into higher positions within the industry, managerial or otherwise, into the research profession, or to teaching careers in further and higher education.

Programme Aims

- To train professionals in electrical and electronic engineering who have the skills and knowledge to apply with confidence proven engineering principles, technological techniques, applications and methods.
- To explore new developments in the field of engineering research, advanced technologies and their application and relevance to electrical and electronic engineering so as to graduate proficient engineers with a robust foundation in the field.
- To acquire knowledge, analyse and evaluate new developments in the electrical and electronic engineering field as they emerge and to apply these appropriately to their chosen specialist field.
- To provide students with the opportunity to gain transferable knowledge and skills to enable them to engage fully into design, research, development, construction and maintenance of engineering systems.
- To produce professional engineers who have the capacity to work at a high standard and who engage in lifelong learning and continuous professional development.
- To educate a network of professionals who produce sustainable outcomes for the success of the industry and the growth of their profession.
- To educate professionals who take responsibility for the impact their work has on the environment and their communities.
- To provide students with the opportunity to gain a critical and informed awareness of contemporary issues, legislation, problems and opportunities afforded by a focus upon engineering in recognition of the impact of the demands of industry.
- To provide academic, technical and personal development through a variety of learning experiences, in particular, the development of communication skills and capability of critical analysis, problem solving, the presentation and justification of rational argument and alternative courses of action.
- To facilitate the opportunity to critically analyse, study and evaluate a range of electrical and electronic engineering problems and topics by providing a systematic and coherent body of knowledge, enabling the acquisition of specialised skills.

- To provide or facilitate access to a range of sources for students to gain transferable skills and create a creative, innovative mindset for engineering problem-solving, accepting accountability for determining and achieving personal and/or group outcomes.

Programme Learning Outcomes

Level 6

Upon successful completion of this level, students will be able to:

1. Work in teams, managing tasks and resources to meet changing technical and managerial needs which support continuous quality improvement.
2. Use interpersonal skills to communicate technical and non-technical information to a variety of audiences.
3. Apply ethical principles to sustainable professional practices in an engineering context which recognise obligations to society, the profession and the environment.
4. Critically evaluate the social, environmental, ethical, economic and commercial considerations that affect electrical and electronic engineering decisions.
5. Analyse essential facts, concepts and theories that can affect or enhance the fundamentals of electrical and electronic engineering disciplines, underpinned by scientific and mathematical principles.
6. Interrogate electrical and electronic engineering problems using a sound evidence base to contribute to improved effectiveness and sustainability of products, systems and services.
7. Use general IT facilities and information retrieval skills to develop planning and teamwork which support lifelong learning and continuing professional development.
8. Use advanced software and hardware for the specific purposes of electrical and electronic engineering applications to plan, design, test and evaluate electrical and electronic engineering solutions and systems.
9. Use and apply quantitative science and engineering tools to the analysis of electrical and electronic engineering problems.
10. Use and apply industry-standard engineering skills through laboratory and workshop activities in design, analysis and control for the continuous improvement of knowledge and quality of industry standards in electrical and electronic engineering.
11. Apply electrical and electronic knowledge and skills to the wider multidisciplinary engineering context and its underlying principles, working in teams of engineers from across all fields and in particular mechanical, mechatronic, energy and industrial engineering.
12. Critically analyse and evaluate complex engineering systems, their inter-dependencies, as well as the place and function of electrical/ electronic systems within them, through the application of systems thinking via analysis of the wider engineering context.
13. Critically apply specialist electrical and electronic engineering principles and knowledge to extend technological capability and knowledge base through new practices and methodologies, and innovative applications and techniques.
14. Independently plan, manage and execute a technically and theoretically informed extended enquiry, which analyses electrical and electronic engineering problems, proposes solutions, broadly deepens knowledge and skills base and critically evaluates outcomes.
15. Provide solutions to identified engineering problems in order to formulate creative designs, products and services, and integrate electrical and electronic engineering solutions with the products, services and processes of other engineering disciplines.
16. Design, develop and implement procedures to undertake engineering tasks, identify problems and develop solutions through critical evaluation.

17. Communicate and work collaboratively with others as well as independently to problem solve, develop innovative ideas and new ways of thinking, and to support the development of electrical and electronic engineering practices and knowledge.

Programme Structure

Module	Level	Credits	%	Category	Description	Length/Word Count	Grading Method
Stage 1							
B4SCENG-EE: Introduction to Academic Study (Mandatory)	4	20	60%	Coursework: Other	Written piece and reflection - MUST PASS	2000	Letter Grade
			40%	Practical: Other	Case study, analysis, interpretation (1500 words) and poster presentation (15 minutes) - MUST PASS	15	Letter Grade
ENG402: Engineering Science (Mandatory)	4	20	50%	Coursework: Report	n/a - MUST PASS	2000	Letter Grade
			50%	Coursework: Report	n/a - MUST PASS	2000	Letter Grade
ENG403: Managing a Professional Engineering Project (Mandatory)	4	20	100%	Coursework: Report	n/a - MUST PASS	3500	Letter Grade
			-	Practical: Presentation	n/a	15	Pass/Fail
ENG404: Engineering Mathematics (Mandatory)	4	20	60%	Coursework: Assignment	n/a - MUST PASS	1200	Percentage Grade
			40%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade
ENG405: Computer Aided Design (Mandatory)	4	20	100%	Coursework: Portfolio / e-Portfolio	n/a - MUST PASS	4000	Letter Grade
ENG406: Engineering Design (Mandatory)	4	20	80%	Coursework: Report	Written design specification and report - MUST PASS	3000	Letter Grade
			20%	Practical: Presentation	n/a - MUST PASS	15-20	Letter Grade
Stage 2							
ENG501: Further Engineering Mathematics (Mandatory)	5	20	50%	Coursework: Other	Applied Mathematical Study - MUST PASS	1600	Percentage Grade
			50%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade
ENG502: Professional Engineering Management (Mandatory)	5	20	100%	Coursework: Portfolio / e-Portfolio	n/a - MUST PASS	4000	Letter Grade
ENG503: Research Project (Mandatory)	5	20	100%	Coursework: Report	n/a - MUST PASS	3000	Letter Grade
			-	Practical: Presentation	n/a - MUST PASS	20	Pass/Fail
ENG524: Analogue and Digital Electronic Systems (Mandatory)	5	20	40%	Coursework: Report	n/a - MUST PASS	1500	Letter Grade
			60%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade

ENG525: Electrical Energy Systems (Mandatory)	5	20	40%	Coursework: Report	Laboratory report	1500	Letter Grade
			60%	Written Exam: Formal Written Examination	Formal written examination	120	Percentage Grade
ENG526: Embedded Systems (Mandatory)	5	20	50%	Coursework: Report	Written technical or laboratory report - MUST PASS	2000	Letter Grade
			50%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade
Stage 3							
ENG601: Dissertation (Mandatory)	6	40	5%	Coursework: Other	Proposal - MUST PASS	1500	Letter Grade
			80%	Coursework: Dissertation	n/a - MUST PASS	10000	Letter Grade
			15%	Practical: Presentation	n/a - MUST PASS	20	Letter Grade
ENG602: Professional Engineer (Mandatory)	6	20	50%	Coursework: Case Study	Written case study analysis - MUST PASS	2000	Letter Grade
			50%	Coursework: Other	Reflective Log and Presentation - MUST PASS	2000	Letter Grade
ENG603: Control and Simulation (Mandatory)	6	20	40%	Coursework: Report	Technical / Laboratory Reports - MUST PASS	1600	Letter Grade
			60%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade
ENG617: Digital Signal and Image Processing (Elective)	6	20	50%	Coursework: Report	Written technical or laboratory report - MUST PASS	2000	Letter Grade
			50%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade
ENG621: Microprocessors and Microcontrollers (Mandatory)	6	20	50%	Coursework: Report	Laboratory Report/s - MUST PASS	2000	Letter Grade
			50%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade
ENG622: Electrical Power (Elective)	6	20	40%	Coursework: Report	Laboratory Report/s - MUST PASS	2000	Letter Grade
			60%	Written Exam: Formal Written Examination	n/a - MUST PASS	120	Percentage Grade

Study Workload

This degree is equivalent to 360 credits and the award you will obtain is a Lancaster University Bachelor of Engineering with Honours.

This programme requires commitment to attend lectures and workshops at Bispham Campus in line with your study timetable. It is a requirement of the programme that you also undertake appropriate independent study and further reading and assessment.

The programme is offered on a full time basis which will typically require attendance on campus for two full days per week over three years. A part time pathway can be followed from level 5 onwards, which would typically require attendance on campus one full (long) day per week over 3 years.

As well as attendance to lectures, you are expected to undertake sufficient self-directed study. For each hour of class contact, you can typically expect to undertake an additional 2-3 hours of work, however this is dependent upon individual progress. You will need to find the right number of hours based on your own needs. Our tutors can help you with advice and support.

Programme Delivery: Learning and Teaching

The programme will be delivered using a range of methods, which may include informal lectures, tutor-led whole group discussions, student presentations, technical workshops, computer laboratory activities, group work, group and individual research and seminars. Modules are designed to integrate practical and theoretical application. Software and laboratory equipment will be regularly introduced by tutors and applied at relevant points within your studies.

You will have the opportunity to participate in extensive laboratory and workshop activities. You will work with a wide range of software packages for electrical and electronic engineers, whether for the planning and layout of electrical installations, for programming or for applying mathematical and scientific principles to the analysis of electrical/electronic engineering problems. In the specialist modules, you will learn from concrete examples, you will apply your skills practically and work on projects of your own interest.

Your tutors will orient the teaching towards industry-specific examples. As your tutors spend 5 days in the industry every year, you will have the opportunity to engage with relevant up-to-date information about your field and you will be able to develop a professional network to enhance your career. You will also have the opportunity to participate in various events, competitions and activities that will enrich your professional practice and will get you to apply the theoretical knowledge you acquire.

Programme Delivery: Assessment

Various modes of assessment will be used in different modules to ensure all aspects of learning are assessed and that you are competent in different forms of demonstrating your knowledge. These will range from real world case studies, live presentations and briefing sessions, written assessments, computer aided design projects and written examinations. You will be supported in the preparation for assessments via readily available tutorial sessions and tutor support.

Programme Delivery: Work Based and Placement Learning

The programme has been designed to carefully align with industrial need.

You are strongly encouraged to gain work experience, via summer internships, short courses in industry, and industrial visits. Although work placement is not an integral part of the programme, we regularly invite guest speakers, employers and previous students at relevant points throughout your studies to integrate the academic and work based experience.

You will also have the opportunity to volunteer for engineering events and competitions which will involve hands-on, experiential learning tasks based on industry practice.

Case studies of workplaces and employment will be embedded within specific modules and will feature throughout the programme, as will the development of aligning attitudes and behaviours expected of a professional engineer.

Programme Delivery: Graduate Skill Development

The BEng (Hons) Electrical and Electronic Engineering programme offers you the opportunity to experience and develop a range of skills related to the discipline. These include accessing and evaluating information from a range of technical sources and communicating findings in a range of ways suitable to engineering.

The following strands linked to graduate outcomes have been identified for the programme:

Collaborative teamwork and leadership skills: Academic and Digital Literacy and Managing a Professional Engineering Project are the two modules that will require you to build solid teamwork and leadership skills. Collaborative projects and assignments will help you enhance and practice this skill set. You will use these skills throughout your studies and across all other modules.

Communication, information and digital literacies: Computer Aided Design, as well as project and academic literacy work will enhance your communication skills at all levels. Along with the Academic and Digital Literacy module. You will pay attention to how you gather and analyse data, what information is relevant and how to use it and present it effectively and professionally.

Personal and intellectual autonomy: Throughout all modules at this level, you will have to learn to become increasingly independent and self-reliant while continuing to participate in group and teamwork. Engineering Mathematics and Engineering Design specifically require a considerable amount of individual work. It is imperative that you gain autonomy at this stage so as to be able to cope with work on Level 5.

Ethical, social and professional understanding: With the modules Professional Engineering Management, and Professional Engineer you will gain a considerable amount of professional skill and understanding and will begin to apply industrial engineering principles to various engineering problems. These will include issues that may have ethical, social, community impacts and you will need to consider these in your work.

Global citizenship: the modules at Level 5 all consider issues of global importance and the examples that you will cover in specialist modules will usually related to issues such as sustainability, innovation, finding suitable solutions to problems arising from an increasingly global society.

Enterprise and entrepreneurial awareness and capabilities: Professional Engineering Management and Research Project are modules that will greatly expand your entrepreneurial awareness and options in this field. Backed up by the specialist modules at this level, you will get insights into the various options individual or team enterprises have and how you can

innovate and create.

Research, scholarship and enquiry skills: You will be applying all other skills and attributes acquired at Level 3 and 4 to the Dissertation module which will build your research, scholarship and enquiry skills to produce an original piece of research on a topic of interest to your field. You will also use them in the module Professional Engineer and across all specialist modules at this level.

A commitment to lifelong learning and career development: At this stage you will already be familiar with the many options Industrial Engineering presents and you will be expected to have an awareness of the professional development path you would like to pursue. Your tutors will help you with advice. All modules will allow you to expand your professional skills and knowledge and will help you pick a direction for lifelong learning and development.

There is a strong emphasis on employability and enhancement of graduate skills in all years of the BEng programmes. From Level 4 study onwards, personal development plans (PDP's) will be driven through a tutorial system and will focus on identifying the skills and attributes of graduate engineers as employees, with the formulation and setting of action plans to achieve them. Teaching, learning and assessment methods allow development of key transferable skills such as problem solving, ethics and globalization through communication and digital literacy. The production of assessment work in varied formats such as engineering reports, essays, oral presentations and discussions will contextualize the communication and cognitive requirements of modern employable engineers

Modules are designed to develop your existing skills to enable you to become independent engineers and will provide the basis for a successful career in engineering, developed through industry and academic research and enquiry. Further skills in technical information analysis and application will be developed during the delivery of the programme content through lectures, guest speakers and research into engineering systems, sub-systems and approaches.

Level 4

During Level 4 study, you will experience a wide-range of the general engineering curriculum across 6 core modules: including managing a professional engineering project, applied mathematics, engineering design and computer aided design. These modules are supported by project and laboratory work and also educational study skills. This broader approach, allows you to sample engineering disciplines so you can switch to an alternative engineering discipline if you choose to do so at the end of this stage. It also ensures that you have a solid grounding in digital literacy, ethical considerations and develop an appetite for lifelong learning which you will carry through into subsequent years and hopefully further study.

Level 5

At Level 5, there are several subject specialist modules. Group and team working will be an inherent part of the programme within your engineering project, allowing peer and self-assessment approaches to be introduced, developing essential communication, ethical awareness and management characteristics. You will continue to apply the principles studied at Level 4 and develop your knowledge and skills in more specialized areas such as electronic systems, electrical, electronic and digital principles as well as systems integration and systems thinking.

Level 6

During Level 6 of the programme, you will experience modules in highly focused areas such as: electrical power, microprocessors & controllers, digital signal and image processing. You will explore and critically analyse the engineering environment within the 'Professional Engineer' module. You will also undertake a dissertation project based on a significant specific engineering project aligned to your interests that will shape and further define your specialized route into your chosen career.

There is a strong emphasis on employability and enhancement of graduate skills in all years of the BEng programmes. From Level 4 study onwards, personal development plans (PDP's) will be driven through a tutorial system and will focus on identifying the skills and attributes of graduate engineers as employees, with the formulation and setting of action plans to achieve them. Teaching, learning and assessment methods allow development of key transferable skills such as problem solving, ethics and globalization through communication and digital literacy.

The production of assessment work in varied formats such as engineering reports, essays, oral presentations and discussions will contextualize the communication and cognitive requirements of modern employable engineers.

Study Costs: Equipment Requirements

Refer to our [tuition fees guide](#).

You will need your own scientific calculator; we recommend the Casio FFX-91ES (costs start from around £15).

Books, Journals and electronic resources can be accessed via the College Learning Resources facility.

Study Costs: Additional Costs

Other Costs

There may be additional costs to consider such as optional educational visits and photocopying/printing. It is highly recommended (but not mandated) that at the start of your programme, you apply for student membership through a professional organisation such as IMechE or IET. Some organisations provide discounted student membership whilst for others there is no charge.

IMechE - Affiliate Member: No charge for an apprentice or studying engineering at college or an undergraduate student studying a STEM degree.

IET - Students and apprentices (one year) £20.00. Students and apprentices (for duration of course, up to five years) £50.00

Cost Benefits

As a student on our programmes you are entitled to discounted (and some free) edition software for educational use. Offers vary from year to year but: Microsoft Student packages, Computer Aided Design and Computation Fluid Dynamics Software are examples of this. Tutors will advise of opportunities available when you start the programme.

Related Courses

Related course within this discipline:

BEng (Hons) Aerospace Engineering
BEng (Hons) Industrial Engineering
BEng (Hons) Mechanical Engineering
BEng (Hons) Mechatronics Engineering