



Programme Specification

ENG-MC-2017: Engineering (Mechanical Engineering)

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

Programme Status: Approved | Version: 2

Introduction

This programme specification provides a summary of the main features of the Engineering (Mechanical 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-MC-2017
Programme Title	Engineering (Mechanical Engineering)
Teaching Institution	Blackpool and The Fylde College
Professional, Statutory and Regulatory Body (PSRB) Accreditation	None
UCAS Code	
Language of Study	English
Version	2
Approval Status	Approved
Approval Date	30 August 2018
JACS Code	
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

Mechanical Engineering is one of the oldest and broadest disciplines in the engineering field. Its grounding principles go centuries back in time and were the main factors for the Industrial Revolution, and the contemporary development of technology. Mechanical engineers apply physics, engineering and science to design, research, analyse, develop, manufacture, test and maintain mechanical systems, from the smallest to the largest ones. This includes providing solutions to the development of miniature systems of moving parts to providing component designs for extremely large machinery, vehicles, factory production lines and many others.

Our BEng (Hons) Mechanical Engineering programme will provide you with core and specialist principles to boost your employability potential within the field. You will have the opportunity to follow a Mechanical pathway, after you have sampled core engineering subjects. Core subjects will be extremely valuable to you as a mechanical engineer, as they will lay the foundation for the specialist subjects that you will be studying. Among these are computer-aided design (CAD), engineering science, mathematics and methods for managing engineering projects. Later in the

programme, as you develop your knowledge and skills, you will be able to explore specialist topics that will present you with opportunities to explore software and practical subject areas such as design, control & simulation and computational fluid dynamics.

You will benefit from a blend of practical and theoretical experiences. In addition to these, you will have opportunities to develop soft skills. Particularly important will be nurturing your creative ability and building your organizational skills – time planning, getting organized to work under the pressure of deadlines. In addition to these, our programme will aim to teach you how to apply your technical and scientific knowledge to concrete, practical problems, and we will get you involved in various activities to develop your profile and ideas. What you will take away after graduation is a set of experiences that will help you in your future career in Mechanical Engineering.

Admission Criteria

The entry criteria for Level 4 of the programme are:

- A minimum of 48 UCAS points for entry post 2017 (or 120 points pre-2017 UCAS system) (excluding functional skills) from one of the following:
 - 2 GCE A2 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 direct entry onto Level 5 of the programme are:

- HNC or HND with an overall merit grade in: Mechanical, General or Aeronautical Engineering or an appropriate Engineering discipline.

At either entry level:

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 to an interview to determine suitability.

Career Options and Progression Opportunities

You will take a range of common core modules at Level 4 along with all our BEng students. They will give you the necessary foundational knowledge. At Level 5, you will follow the Mechanical Engineering pathway with a series of specialist modules. Below, you will find an overview of what you need to know if you are considering Mechanical Engineering.

Mechanical engineers are versatile, adaptable employees. You can go into a very wide range of sectors among which are construction, energy and power, transport, manufacturing, aerospace, automotive, and even fields such as chemical or pharmaceutical and biomedical. You will be employable in a range of positions involving the management of projects or people, or resources. You will also be able to work in the development of new technologies, systems and materials.

After graduation your options will vary significantly, depending on what you would like to do. You might choose to go into research and further study. You will, however, be immediately employable upon graduation and will be able to work across all sectors. Mechanical Engineering nowadays is in rapid growth. This opens opportunities for developing top-notch technologies like designing and developing medical products (mechanical body parts) or optimizing production lines and processes in large factories and refineries.

As a mechanical engineer, your day might include office work with regular visits to plants, factories and workshops. You might also work at building sites. Work will include developing, and evaluating theoretical designs, putting them into concrete shape and testing performance. You will have to consider implications of cost, safety and time constraints to products and processes, and you will be striving to implement cost-effective, sustainable solutions to problems. Safety will be of great importance in your work.

You will probably travel frequently and gain solid experience in a few years. You will most certainly have international opportunities at some point in your career. If you become a member of the IET and/or IMechE, you might also have professional growth there and get involved in contributing to the engineering community at large. For women in particular, Women's Engineering Society (WES) also provides a network for various initiatives.

Salaries for mechanical engineers are in the upper range and at a senior level vary considerably. With experience and if you engage in regular professional development you may expect excellent progression opportunities with salaries of £45,000 to over £60,000. These will vary from one company to another and across sectors.

Programme Aims

- To train mechanical engineers to a high level of technical and scientific knowledge, and the ability to apply their skills in confidence to practical problems.
- To provide a robust foundation and framework in mechanical engineering.
- To produce professional mechanical engineers who have the capacity to consider time, cost and resource constraints and to successfully manage projects and people in the field.
- To provide students with the opportunity to gain a critical and informed awareness of contemporary issues, sustainability, energy efficiency, health and safety, legislation, problems and opportunities afforded by a focus upon mechanical engineering in recognition of the impact of the demands of industry.
- To explore new developments in the field of mechanical engineering, engineering research and advanced technologies as well as manufacturing.
- To acquire knowledge, analyse and evaluate new developments in mechanical engineering as well as to engage in the conception, creation and invention of such developments, and to apply these appropriately to mechanical engineering.
- 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 sustainable, durable and efficient mechanical engineering systems.
- To produce a network of educated professionals who consider sustainable outcomes for the success of their profession and community, and who take responsibility for lifelong learning for successful career development.
- 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 pursue the level of study which will enable students to critically review, consolidate and extend a systematic and coherent body of knowledge, by utilising specialised skills across an area of study.
- To enable students to critically evaluate concepts and evidence from a range of sources, to transfer and apply diagnostic and creative skills and exercise significant judgement in a range of situations, accepting responsibility and 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 analyse and evaluate mechanical systems through the application of systems thinking, relating their operation, functioning and integration to other engineering systems
5. Independently plan, manage and execute a technically and theoretically informed project, which focuses on mechanical engineering problems, by proposing technically viable solutions that operate efficiently and sustainably, and are integratable into other engineering systems
6. Apply mechanical engineering concepts, theories and fundamentals of engineering disciplines, utilising sound scientific and mathematical reasoning
7. Provide solutions to identified mechanical problems in order to formulate creative and innovative designs, products and services
8. Use general IT facilities and information retrieval skills to develop planning and teamwork which support the resolution of mechanical engineering problems or the development of new mechanical engineering solutions
9. Creatively extend the technological capabilities of given solutions by creating, building or designing products, systems or processes through the application of specialist mechanical engineering principles
10. Design, develop, test and maintain sustainable, optimized mechanical engineering solutions to engineering problems that observe the principles of quantitative science
11. Apply mechanical engineering knowledge and skills to a wide variety of contexts to obtain efficient and effective working solutions to engineering problems and needs
12. Address issues and operational malfunctions or defects by using a sound evidence base, contributing to improved effectiveness of engineering products, systems and services, sustainably repairing old or producing new technologies that operate safely and are durable
13. Evaluate the social, environmental, ethical, economic and commercial considerations that affect engineering decisions and judgement
14. Design, develop and implement procedures to undertake engineering tasks, identify problems and develop solutions through critical evaluation
15. Use and apply industry standard engineering skills through laboratory and workshop activities in design, analysis and control
16. Develop mechanical engineering solutions to industry standards with the intention to continually enhance and improve these standards

Programme Structure

Pathway	Module	Level	Credits	Coursework	Practical	Written Exam
Stage 1						
All	B4SCENG-MC: Introduction to Academic Study (Mandatory)	4	20	60%	40%	
	ENG402: Engineering Science (Mandatory)	4	20	100%		
	ENG403: Managing a Professional Engineering Project (Mandatory)	4	20	100%		
	ENG404: Engineering Mathematics (Mandatory)	4	20	60%		40%
	ENG405: Computer Aided Design (Mandatory)	4	20	100%		
	ENG406: Engineering Design (Mandatory)	4	20	80%	20%	
Stage 2						
Stage exit award: LU Diploma of Higher Education (Awarded by Lancaster University)						
All	ENG501: Further Engineering Mathematics (Mandatory)	5	20	50%		50%
	ENG502: Professional Engineering Management (Mandatory)	5	20	100%		
	ENG503: Research Project (Mandatory)	5	20	100%		
	ENG504: Engineering Dynamics (Mandatory)	5	20	50%		50%
	ENG511: Thermofluids with CFD (Mandatory)	5	20	100%		
	ENG512: Mechanics of Materials and Structures (Mandatory)	5	20	50%		50%
Stage 3						
Stage award: LU Bachelor of Engineering with Honours (Awarded by Lancaster University)						
All	ENG601: Dissertation (Mandatory)	6	40	85%	15%	
	ENG602: Professional Engineer (Mandatory)	6	20	100%		
	ENG603: Control and Simulation (Mandatory)	6	20	40%		60%
	ENG611: Structural and Dynamic Analysis (Mandatory)	6	20	40%		60%
	ENG612: Thermodynamic Systems (Mandatory)	6	20	50%		50%

Course Options

At Level 4, you will be taking a range of common core modules to provide you with the basics of engineering. By the time you reach Level 5, you will follow a Mechanical Engineering pathway and have the specialist modules for it in addition to a few common core topics.

The programme is offered on a full-time basis, however there is also opportunity for employees to enter the programme at Level 5 with a suitable entry qualification and study on a part time basis to align with employment needs:

- Full time - typically 2-3 days per week over 3 years
- Part time - typically 1 day per week over 3 years (with direct entry to Level 5 via a suitable HNC/D).

Please note: Level 4 is delivered on a full-time basis only. We offer an alternative part-time HNC route onto the degree programme also if required.

Study Workload

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 course 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, so software and laboratory equipment will be regularly introduced by tutors and applied at relevant points within your studies.

You will significantly benefit from relatively small class sizes and a warm and friendly learning environment which encourages effective group interaction. Tutors are very accessible and supportive which will enhance your learning experience by one-on-one support when needed. You will have access to outstanding specialist facilities and equipment including our Advanced Technology Centre (new in 2015). This will allow you to work with industry-standard equipment and software relevant to your future engineering career. You will practice with the tools of your trade and will exercise in facilities that are close to real-life scenarios.

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. 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 Mechanical 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.

Modules are designed to develop your existing skills to enable you to become independent mechanical 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

- **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 analyze 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.

During Level 4 study, you will experience a wide-range of the general engineering curriculum across 6 core modules: including mechanical engineering, electrical and electronic engineering, applied mathematics, engineering design and computer aided engineering. 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

- **Ethical, social and professional understanding:** With the module Professional Engineering Management as well as with the specialty modules Thermofluids with CFD, Mechanics of Materials and Structures and Engineering Dynamics, you will gain a considerable amount of professional skill and understanding and will begin to apply mechanical 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.

At Level 5, there are four core modules and two subject specialist modules for the mechanical pathway. 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 materials & structures, fluid dynamics, computational fluid dynamics and computer aided design.

Level 6

- **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 Mechanical 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. Of particular importance are the modules Control and Simulation, Structural and Dynamic Analysis and Thermodynamic Systems, which will allow you to expand your professional skills and knowledge and will help you pick a direction for lifelong learning and development.

During Level 6 of the programme, you will experience 5 modules in highly focused areas such as: structural and dynamic analysis, thermodynamic systems, controls & simulation. 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 mechanical 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

Equipment Needs:

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.

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.

Study Costs: Additional Costs

Read our [tuition fees guide](#).

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

*Correct at 2016

Related Courses

Related course within this discipline:

BEng Aerospace
BEng Mechatronics