

Mechanical Engineering

Programme Information

2022.01, Approved

Overview

Programme Code	36537
Programme Title	Mechanical Engineering
Awarding Institution	Liverpool John Moores University
Programme Type	Degree

Awards

Award Type	Award Description	Award Learning Outcomes
Alternative Exit	Bachelor of Engineering (SW) - SBG	Students who obtain this award will have achieved most but not all of the programme learning outcomes of the equivalent Bachelors award with honours.
Recruitable Target	Bachelor of Engineering Honours (SW) - SBGH	In addition to the learning outcomes for the main target award, demonstrate the professional and personal skills necessary for effective employment within a professional environment.
Target Award	Bachelor of Engineering with Honours - BGH	N/A
Alternative Exit	Certificate of Higher Education - CHE	Undertake suitable basic mathematical analysis. Undertake suitable basic mathematical analysis. Apply the basic principles of applied mechanics, thermodynamics and fluid mechanics, materials science and electrical engineering to simplified engineering problems. Apply the basic principles of applied mechanics, thermodynamics and fluid mechanics, materials science and electrical engineering to simplified engineering problems. Design and manufacture simple engineering components and assemblies. Design and manufacture simple engineering components and assemblies. Demonstrate key skills appropriate to the professional engineer. Demonstrate key skills appropriate to the professional engineer.
Alternative Exit	Diploma of Higher Education - DHE	Undertake advanced mathematical and computational studies of engineering systems and problems. Demonstrate the application of intermediate level applied mechanics, thermodynamics and fluid mechanics, and electrical engineering from the solution of standard engineering problems. Demonstrate the intermediate engineering skills that will be required for further study. Demonstrate a competence in technical reporting and an ability to analyse and present engineering data.

Alternate Award Names	
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Partner Name	Partnership Type
Beaconhouse Group	Franchised

External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)
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Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length Programme Length Unit
Full-Time, Face to Face	September	Beaconhouse IC Islamabad	4 Years
Full-Time, Face to Face	September	Beaconhouse IC Islamabad	3 Years

Aims and Outcomes

Educational Aims of the Programme	<p>The B.Eng. programme in Mechanical Engineering is designed to develop a high level of technical expertise together with the emotional intelligence to be able to practice successfully as a professional engineer in a modern interdisciplinary engineering environment. Graduate engineers are increasingly expected to take on important technical leadership and management responsibilities early in their careers and the knowledge and skills gained from this programme are designed to produce graduates who are able to make an immediate contribution to their employers organisations. The programme aims to:</p> <ul style="list-style-type: none"> - Develop students transferable skills and professional behavioural traits above those associated with a M.Eng graduate that will allow students that complete the programme to hold responsible technical and managerial roles within a range of mechanical engineering and associated industries. - Deliver the educational experience in which students can develop their knowledge of engineering science, core engineering principles and fundamental underpinning subjects such as mathematics and computation. - Develop students confidence to analyse challenging technical problems and to further develop their core engineering knowledge and skills through the investigation and development of credible and robust solutions. - Provide students with appropriate support and encouragement to develop the necessary skills such that they can study independently and take responsibility for their own learning and subsequent professional development. - Provide engineering graduates with a range of highly relevant transferable skills such as team working, communication, management, problem solving, computing and technical computing. - Provide a programme of study that fully meets the requirements of the Engineering Councils UK Standard for Professional Engineering Competence (UKSpec) and partially qualifies the successful graduate for the attainment of the Engineering Council Chartered Engineer status after completion of an appropriate period of industrial experience. - Produce graduates with an increased depth, breadth of knowledge and understanding of mechanical engineering, management and teamwork to enable them to rapidly assume technical leadership and management roles. - For students undertaking a placement year the aim is to provide students with an extended period of work experience at an approved partner that will complement their programme of study. This will give the students the opportunity to develop professional skills relevant to their programme of study, as well as attitude and behaviours necessary for employment in a diverse and changing environment.
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Learning Outcomes

Code	Number	Description
PLO1	1	Demonstrate their knowledge and understanding of essential facts, concepts, theories and principles of their engineering discipline, and its underpinning science and mathematics. They must have an appreciation of the wider multidisciplinary engineering context and its underlying principles. They must appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgment.
PLO2	2	Make general evaluations of commercial risks through some understanding of the basic of such risks.
PLO3	3	Demonstrate an extensive knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately to strategic and tactical issues.

PLO4	4	Understand the requirement for engineering activities to promote sustainable development.
PLO5	5	Demonstrate an awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues.
PLO6	6	Understand the need for a high level of professional and ethical conduct in engineering.
PLO7	7	Illustrate an understanding of and the ability to apply a systems approach to engineering problems.
PLO8	8	Apply practical engineering skills acquired through, for example, work carried out in laboratories and workshops; in industry through supervised work experience; in individual and group project work; in design work; and in the development and use of computer software in design, analysis and control. Evidence of group working and of participation in a major project is expected.
PLO9	9	Demonstrate a thorough understanding of current practice and its limitations and some appreciation of likely new developments.
PLO10	10	Demonstrate an extensive knowledge and understanding of a wide range of engineering materials and components.
PLO11	11	Understand the context in which engineering knowledge can be applied (e.g. operations and management, technology, development, etc).
PLO12	12	Demonstrate a comprehensive understanding of the scientific principles of mechanical and related engineering disciplines.
PLO13	13	Demonstrate a wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations.
PLO14	14	Illustrate an understanding of customer and user needs and the importance of considerations such as aesthetics.
PLO15	15	Identify and manage cost drivers.
PLO16	16	Generate an innovative design for products, systems, components or processes to fulfil new needs.
PLO17	17	Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal.
PLO18	18	Demonstrate an ability to manage the design process and evaluate outcomes.
PLO19	19	Demonstrate transferable skills including problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills.
PLO20	20	Demonstrate the use of technical literature and other information sources.
PLO21	21	Demonstrate an awareness of nature of intellectual property and contractual issues.
PLO22	22	Demonstrate the understanding of appropriate codes of practice and industry standards.
PLO23	23	Demonstrate comprehensive knowledge and understanding of mathematical and computer models relevant to the mechanical and related engineering disciplines, and an appreciation of their limitations
PLO24	24	Illustrate an awareness of quality issues.
PLO25	25	Demonstrate an ability to apply engineering techniques taking account of a range of commercial and industrial constraints.
PLO26	26	Demonstrate an understanding of concepts from a range of areas including some outside engineering, and the ability to apply them effectively in engineering projects.

PLO27	27	Demonstrate an awareness of developing technologies related to mechanical engineering.
PLO28	28	Use fundamental knowledge to investigate new and emerging technologies
PLO29	29	Extract data pertinent to an unfamiliar problem, and apply its solution using computer based engineering tools when appropriate.
PLO30	30	Apply mathematical and computer-based models for solving problems in engineering, and the ability to assess the limitations of particular cases.
PLO31	31	Apply appropriate quantitative science and engineering tools to the analysis of problems. They must be able to demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs. They must be able to comprehend the broad picture and thus work with an appropriate level of detail.

Course Structure

Programme Structure Description	Option Modules Student are required to select two option modules at L6. The options are:- Fluid Dynamics and Heat Transfer Thermodynamics Structural Integrity Dynamics and Control Students have the option to undertake a placement year. The placement year, module 5508MECBHG will follow Level 5 and students will be enrolled on a 480 credit honours sandwich programme. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5. Students successfully completing the assessment of the placement year are eligible for a Sandwich award. Students not undertaking a placement year are registered on the non-sandwich version of the programme.
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Programme Structure - 360 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4501MECBHG Engineering Mathematics 1a Approved 2022.01 - 10 credit points	
[MODULE] 4502MECBHG Engineering Mathematics 1b Approved 2022.01 - 10 credit points	
[MODULE] 4503MECBHG Applied Mechanics 1 Approved 2022.01 - 20 credit points	
[MODULE] 4504MECBHG Thermodynamics and Fluid Mechanics 1 Approved 2022.01 - 20 credit points	
[MODULE] 4505MECBHG Materials Approved 2022.01 - 20 credit points	
[MODULE] 4506MECBHG Engineering Practice 1 Approved 2022.01 - 20 credit points	
[MODULE] 4507MECBHG Electrical and Electronic Engineering Approved 2022.01 - 20 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5501MECBHG Engineering Mathematics 2 Approved 2022.01 - 10 credit points	
[MODULE] 5502MECBHG Materials and Processes Approved 2022.01 - 10 credit points	
[MODULE] 5503MECBHG Applied Mechanics 2 Approved 2022.01 - 20 credit points	
[MODULE] 5504MECBHG Thermodynamics and Fluid Mechanics 2 Approved 2022.01 - 20 credit points	
[MODULE] 5505MECBHG Mechanical Engineering Design 2 Approved 2022.01 - 20 credit points	
[MODULE] 5506MECBHG Engineering Practice 2 Approved 2022.01 - 20 credit points	
[MODULE] 5507MECBHG Mechatronics Approved 2022.01 - 20 credit points	
Optional placement - 120 credit points	OPTIONAL
Placement Year - 120 credit points	OPTIONAL
[MODULE] 5508MECBHG Sandwich Year - Mechanical Engineering Approved 2022.01 - 120 credit points	
Level 6 - 120 credit points	
Level 6 Core - 100 credit points	CORE
[MODULE] 6501MECBHG Engineering Project Approved 2022.01 - 40 credit points	
[MODULE] 6502MECBHG Engineering Analysis Approved 2022.01 - 20 credit points	

[MODULE] 6503MECBHG Mechanical Engineering Design 3 Approved 2022.01 - 20 credit points	
[MODULE] 6504MECBHG Industrial Management Approved 2022.01 - 20 credit points	
Level 6 Optional - 20 credit points	OPTIONAL
[MODULE] 6505MECBHG Fluid Dynamics and Heat Transfer Approved 2022.01 - 10 credit points	
[MODULE] 6506MECBHG Thermodynamics Approved 2022.01 - 10 credit points	
[MODULE] 6508MECBHG Structural Integrity Approved 2022.01 - 10 credit points	
[MODULE] 6510MECBHG Dynamics and Control Approved 2022.01 - 10 credit points	

Approved variance from Academic Framework Regulations

Variance
The module Engineering Practice 2 (5107MECH) will be delivered year-long across both semesters to allow student access to the required Laboratory provision during the academic 2020-21 due to the Covid 19 pandemic.

Teaching, Learning and Assessment

Teaching, Learning and Assessment	Acquisition of underpinning knowledge is achieved mainly through lectures and directed student-centred learning. Student-centred learning is used where appropriate resource material is available. Understanding is reinforced through case-studies. Testing of the knowledge base is through a combination of unseen written examinations, online assessment, coursework in the form of case-study reports and coursework assignment submissions. The students must appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement. Acquisition of Intellectual skills is achieved mainly through lectures and direct student-centred learning. Student-centred learning is used where appropriate resource material is available. Understanding is reinforced through case-studies. Engineering design, analysis and practical skills are taught almost exclusively by individual and group project work supported by a lecture programme appropriate to the demands of the project. Engineering design and practical skills are assessed by individual and group written design project reports, student presentations and presentations using computer graphics. The economic, Social and Environmental context of engineering operations is delivered by means of lectures and case studies. The use of appropriate case study material is an essential part of teaching in this area. Assessment is via a combination of unseen written examinations and coursework in the form of case-study reports
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Opportunities for work related learning

Opportunities for work related learning
Students are encouraged to undertake a year's industrial placement between Level 5 and 6. There is a further opportunity to undertake summer placements between academic years to gain valuable industrial experience. There are also opportunities to complete industrially based projects via individual engineering projects at Level 6.

Entry Requirements

Type	Description
A levels	Applicants should have 112 UCAS tariff points including a minimum of 64 points from Maths and one of the following: Physics, Chemistry, Computing, Further Maths, Electronics or Engineering
International Baccalaureate	Applicants should have 112 UCAS tariff points including a minimum of 64 points from Higher level Maths and Physics.
Other international requirements	HSSC - Intermediate / Higher Secondary Certificate: entry to level 4 requires a 75% overall award mark ; mathematics passed at 70% or above in final year, passes in physics and chemistry. Students who achieve less than any of the entry requirements stated in this section 'Criteria for Admission', would be required to either: (i) register for an International Foundation Year programme [Level 3]; or (ii) have successfully completed an International Foundation Year programme for entry to Level 4.
BTECs	BTEC Extended Diploma - DMM / 112 UCAS tariff points. Engineering discipline required with a Distinction grade in Further Mathematics unit.
Alternative qualifications considered	Applicants should also have five GCSE (or equivalent) passes of at least grade C including Mathematics. Applicants must have English language skills at the level required to study the programme, these are: a GCSE 'O Level' English of at least grade C (or IELTS 6.0 or equivalent) ; or the candidate will have studied a first degree that has been taught and assessed in English

Programme Contacts

Programme Leader

Contact Name

Link Tutor

Contact Name

Russell English
