Programme Specification Document

Approved, 2022.03

Overview

Programme Code	46632
Programme Title	Mechanical Engineering
Awarding Institution	Liverpool John Moores University
Programme Type	Degree with Foundation
Language of Programme	All LJMU programmes are delivered and assessed in English
Programme Leader	
Link Tutor(s)	Russell English

Partner Name	Partnership Type
Oryx Universal College WLL	Franchised

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Bachelor of Engineering with Honours (Fnd) - BGHF	See Learning Outcomes Below
Alternative Exit	Diploma of Higher Education (Fnd) - DHEF	A student who is eligible for this award will be able to: 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 to 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. Target award Learning Outcomes - Bachelor of Engineering with
Alternative Exit	Certificate of Higher Education (Fnd) - CHEF	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. Design and manufacture simple engineering components and assemblies. Demonstrate key skills appropriate to the professional engineer.

Alternate Award Names	

External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)

Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length
Full-Time, Face to Face	April	Oryx Universal College WLL	4 Years
Full-Time, Face to Face	January	Oryx Universal College WLL	4 Years
Full-Time, Face to Face	September	Oryx Universal College WLL	4 Years

Aims and Outcomes

Educational Aims of the Programme

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 practise 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: - 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. - Produce graduates with a depth, breadth of knowledge and understanding of mechanical engineering, management and teamwork to enable them to rapidly assume technical leadership and management roles.

Learning Outcomes

Code	Description
PLO1	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	Demonstrate a knowledge and understanding of scientific principles and methodology necessary to underpin their education in mechanical engineering, to enable appreciation of its scientific and engineering context, and to support their understanding of historical, current, and future developments and technologies.
PLO3	Illustrate a knowledge and understanding of mathematical principles necessary to underpin their education in mechanical engineering and related engineering disciplines and to enable them to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems.
PLO4	Apply and integrate knowledge and understanding of other engineering disciplines to support study of mechanical and related engineering disciplines.
PLO5	Understand engineering principles and the ability to apply them to analyse key engineering processes.
PLO6	Identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.
PLO7	Apply quantitative methods and computer software relevant to mechanical and related engineering disciplines to solve engineering problems.
PLO8	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.

Code	Description
PLO9	Demonstrate an understanding of and ability to apply a systems approach to engineering problems.
PLO10	Demonstrate a knowledge and understanding of the commercial and economic context of engineering processes.
PLO11	Illustrate a knowledge of management techniques which may be used to achieve engineering objectives within that context.
PLO12	Understand the requirement for engineering activities to promote sustainable development.
PLO13	Demonstrate an awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues.
PLO14	Understand the need for a high level of professional and ethical conduct in engineering.
PLO15	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
PLO16	Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues.
PLO17	Understand customer and user needs and the importance of considerations such as aesthetics
PLO18	Identify and manage cost drivers.
PLO19	Demonstrate creativity to establish innovative solutions
PLO20	Illustrate creativity to establish innovative solutions.
PLO21	Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal.
PLO22	Manage the design process and evaluate outcomes
PLO23	Demonstrate a knowledge of the characteristics of particular equipment, processes or products
PLO24	Develop engineering workshop and laboratory skills.
PLO25	Demonstrate an Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology, development, etc).
PLO26	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.
PLO27	Understand the use of technical literature and other information sources
PLO28	Demonstrate an awareness of nature of intellectual property and contractual issues
PLO29	Demonstrate an understanding of appropriate codes of practice and industry standards
PLO30	Illustrate an awareness of quality issues
PLO31	Demonstrate an ability to work with technical uncertainty

Programme Structure

Programme Structure Description

The marks from Level 5 and 6 assessments contribute to the final degree classification i.e. 25% of Level 5 marks and 75% of Level 6. Option Modules Student are required to select two option modules at L6, one from each semester. The options are:- Semester One Fluid Dynamics and Heat Transfer Materials Engineering Manufacturing Processes and Industrial Automation Semester Two Thermodynamics Structural Integrity Dynamics and Control

Programme Structure - 480 credit points	
Level 3 - 120 credit points	
Level 3 Core - 120 credit points	CORE
[MODULE] 3500FETQR Academic English Skills (AES) Approved 2022.01 - 40 credit points	
[MODULE] 3503FETQR Project Study Approved 2022.02 - 20 credit points	
[MODULE] 3504FETQR Foundation Mathematics for Engineering and Technology 1 Approved 2022.01 - 20 credit points	
[MODULE] 3505FETQR Foundation Mathematics for Engineering and Technology 2 Approved 2022.01 - 20 credit points	
[MODULE] 3506FETQR Introductory Foundation Physics Approved 2022.01 - 20 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4000MEQR Engineering Mathematics 1a Approved 2022.01 - 10 credit points	
[MODULE] 4001MEQR Engineering Mathematics 1b Approved 2022.01 - 10 credit points	
[MODULE] 4002MEQR Applied Mechanics 1 Approved 2022.01 - 20 credit points	
[MODULE] 4003MEQR Thermodynamics and Fluid Mechanics 1 Approved 2022.01 - 20 credit points	
[MODULE] 4004MEQR Materials Approved 2022.01 - 20 credit points	
[MODULE] 4005MEQR Engineering Practice 1 Approved 2022.01 - 20 credit points	
[MODULE] 4006MEQR Electrical and Electronic Engineering Approved 2022.01 - 20 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5000MEQR Engineering Mathematics 2 Approved 2022.01 - 10 credit points	
[MODULE] 5001MEQR Materials and Processes Approved 2022.01 - 10 credit points	
[MODULE] 5002MEQR Applied Mechanics 2 Approved 2022.01 - 20 credit points	
[MODULE] 5003MEQR Thermodynamics and Fluid Mechanics 2 Approved 2022.01 - 20 credit points	
[MODULE] 5004MEQR Mechanical Engineering Design 2 Approved 2022.01 - 20 credit points	
[MODULE] 5005MEQR Engineering Practice 2 Approved 2022.01 - 20 credit points	
[MODULE] 5006MEQR Mechatronics Approved 2022.01 - 20 credit points	
Level 6 - 120 credit points	
Level 6 Core - 100 credit points	CORE
[MODULE] 6000MEQR Engineering Project Approved 2022.01 - 40 credit points	
[MODULE] 6001MEQR Engineering Analysis Approved 2022.01 - 20 credit points	
[MODULE] 6002MEQR Mechanical Engineering Design 3 Approved 2022.01 - 20 credit points	
[MODULE] 6003MEQR Industrial Management Approved 2022.01 - 20 credit points	
Level 6 Optional - 20 credit points	OPTIONAL
[MODULE] 6004MEQR Fluid Dynamics and Heat Transfer Approved 2022.01 - 10 credit points	
[MODULE] 6005MEQR Thermodynamics Approved 2022.01 - 10 credit points	

[MODULE] 6007MEQR Structural Integrity Approved 2022.01 - 10 credit points
[MODULE] 6008MEQR Manufacturing Processes and Industrial Automation Approved 2022.01 - 10 credit points
[MODULE] 6009MEQR Dynamics and Control Approved 2022.01 - 10 credit points

Module specifications may be accessed at https://proformas.ljmu.ac.uk/Default.aspx

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, 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.

Opportunities for work related learning

Students are encouraged to undertake industrial placements when possible during their studies (for example summer placements between academic years to gain valuable industrial experience). Much assessment will be based on work related learning with the use of case studies and industry standard software where appropriate. This assessment will help develop understanding of the world of work environment suitable for the programme and increase a student's professional practical skills

Entry Requirements

Type	Description
Other international requirements	Entry of level-3: Qualification: A score of 60% or above in Al Thanawiyya al Amma (Qatari curriculum High School exam conducted by the Ministry of Education and Higher Education in Qatar), or equivalent high school qualification approved by LJMU's academic registry (e.g. passing 5-IGCSE & 2-AS subjects). English: IELTS score 5.0 OR an equivalent English Language Proficiency Assessment approved by LJMU's academic registry.

Extra Entry Requirements