

# Mechanical Engineering

## Programme Information

2022.01, Approved

### Overview

Programme Code	36632
Programme Title	Mechanical Engineering
Awarding Institution	Liverpool John Moores University
Programme Type	Degree

### Awards

Award Type	Award Description	Award Learning Outcomes
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 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.

Alternate Award Names	
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Partner Name	Partnership Type
Oryx Universal College WLL	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
Part-Time, Face to Face	April	Oryx Universal College WLL	3 Years
Part-Time, Face to Face	January	Oryx Universal College WLL	3 Years
Part-Time, Face to Face	September	Oryx Universal College WLL	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: - Develop students transferable skills and professional behavioural traits 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. - 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.</p>
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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	The marks from level 5 and 6 assessments contribute to the final degree classification i.e. 25% of Level 5 marks, 75% of Level 6 marks. 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
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<b>Programme Structure - 360 credit points</b>	
<b>Level 4 - 120 credit points</b>	
<b>Level 4 Core - 120 credit points</b>	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	
<b>Level 5 - 120 credit points</b>	
<b>Level 5 Core - 120 credit points</b>	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	
<b>Level 6 - 120 credit points</b>	
<b>Level 6 Core - 100 credit points</b>	CORE
[MODULE] 6000MEQR Engineering Project Approved 2022.01 - 40 credit points	
[MODULE] 6001MEQR Engineering Analysis Approved 2022.01 - 20 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	
<b>Level 6 Optional - 20 credit points</b>	OPTIONAL

[MODULE] 6004MEQR Fluid Dynamics and Heat Transfer Approved 2022.01 - 10 credit points
[MODULE] 6005MEQR Thermodynamics Approved 2022.01 - 10 credit points
[MODULE] 6006MEQR Materials Engineering 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

**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	<p>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</p>
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## Opportunities for work related learning

Opportunities for work related learning
<p>The curriculum fosters and embeds employability by the fact that it has been designed based on UKSPEC which details the knowledge, understanding and skills required of a professional engineer, which are transferable internationally. Currently there are no work placement opportunities within the programme although students are encouraged to seek employment during the summer vacations. Further, work based learning is included in the curriculum via case studies and students may undertake their final year 'engineering projects' with industry involvement.</p>

## Entry Requirements

Type	Description
Other international requirements	<p>Entry to level-4 A Level equal to 112 UCAS points, OR an equivalent qualification approved by LJMU's academic registry (e.g. International Foundation Year). English : IELTS score 6.0 OR an equivalent English Language Proficiency Assessment approved by LJMU's academic registry.            ----- Advanced Entry (Level-5 &amp; Level-6):            Qualification: All advanced entry applications/claims will be considered based on LJMU's RP(E)L policy. All applications will be processed by OUC admissions team and assessed by the program team of the academic affairs department e.g. Curriculum mapping will be submitted to LJMU's FRG for approval RP(E)L claim approval. English: IELTS score 6.0 OR an equivalent English Language Proficiency Assessment approved by LJMU's academic registry.</p>

## Programme Contacts

### Programme Leader

Contact Name
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### Link Tutor

Contact Name
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