

## Overview

<b>Programme Code</b>	46194
<b>Programme Title</b>	Mechanical Engineering
<b>Awarding Institution</b>	Liverpool John Moores University
<b>Programme Type</b>	Degree with Foundation
<b>Language of Programme</b>	All LJMU programmes are delivered and assessed in English
<b>Programme Leader</b>	
<b>Link Tutor(s)</b>	Dante Matellini

<b>Partner Name</b>	<b>Partnership Type</b>
University of Shanghai For Science and Technology	Dual

## 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	Demonstrate the application of intermediate level mathematics, engineering principles and natural sciences to the analysis and solution of standard engineering problems. Select and apply appropriate computational and analytical techniques to model standard problems, recognising the limitations of the techniques employed. Select and evaluate technical literature and other sources of information to address complex problems. Use practical laboratory and workshop skills to investigate complex problems. Demonstrate the intermediate engineering skills that will be required for further study. Function effectively as an individual, and as a member or leader of a team. Demonstrate a competence in technical reporting and an ability to analyse and present engineering data.
Alternative Exit	Foundation Certificate - FC	Study effectively as reflective and independent learners at level 3 and above. Select and apply appropriate basic mathematical techniques to engineering and technology problems. Use basic physical models and understand how physical principles underpin a range of engineering and technology disciplines. Carry out an effective experimental investigation.
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 simple engineering components and select appropriate manufacturing processes. Create and interpret CAD models and engineering drawings which are produced to current standards. Use practical laboratory and workshop skills to investigate engineering problems. 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	September	University of Shanghai For Science and Technology	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. - 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 a depth, breadth of knowledge and understanding of mechanical engineering, management and teamwork to enable them to rapidly assume technical leadership and management roles. - Encourage students to engage with the development of employability skills by completing a self-awareness statement.

### Learning Outcomes

Code	Description
PLO1	Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study.
PLO2	Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.
PLO3	Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed.
PLO4	Select and evaluate technical literature and other sources of information to address complex problems.
PLO5	Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

<b>Code</b>	<b>Description</b>
PLO6	Apply an integrated or systems approach to the solution of complex problems.
PLO7	Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts.
PLO8	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.
PLO9	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.
PLO10	Adopt a holistic and proportionate approach to the mitigation of security risks.
PLO11	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.
PLO12	Use practical laboratory and workshop skills to investigate complex problems.
PLO13	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.
PLO14	Discuss the role of quality management systems and continuous improvement in the context of complex problems.
PLO15	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.
PLO16	Function effectively as an individual, and as a member or leader of a team.
PLO17	Communicate effectively on complex engineering matters with technical and non-technical audiences.
PLO18	Plan and record self learning and development as the foundation for lifelong learning/CPD.

## Programme Structure

### Programme Structure Description

There is no RP(E)L allowed on to this programme. This is a requirement of the Chinese Ministry of Education (MOE).

Continuing students who started prior to 2022 will adopt the programme rules on this version.

<b>Programme Structure - 480 credit points</b>	
<b>Level 3 - 120 credit points</b>	
<b>Level 3 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 3508USST Engineering and Technology Practice Approved 2022.01 - 20 credit points	
[MODULE] 3509USST Foundation Mathematics for Engineering and Technology 1 Approved 2022.02 - 20 credit points	
[MODULE] 3510USST Foundation Mathematics for Engineering and Technology 2 Approved 2022.01 - 20 credit points	
[MODULE] 3511USST Introductory Foundation Physics Approved 2022.01 - 20 credit points	
[MODULE] 3512USST Additional Foundation Physics Approved 2022.01 - 20 credit points	
[MODULE] 3513USST English Language Studies Approved 2022.01 - 20 credit points	
<b>Level 4 - 120 credit points</b>	
<b>Level 4 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 4513USST Engineering Practice Approved 2022.01 - 20 credit points	
[MODULE] 4514USST Engineering Mathematics 1a Approved 2022.02 - 10 credit points	
[MODULE] 4515USST Applied Mechanics 1 Approved 2022.02 - 20 credit points	
[MODULE] 4516USST Materials Approved 2022.02 - 20 credit points	
[MODULE] 4517USST Thermodynamics and Fluid Mechanics 1 Approved 2022.01 - 20 credit points	
[MODULE] 4518USST Mechatronics 1 Approved 2022.01 - 20 credit points	
[MODULE] 4519USST Engineering Mathematics 1b Approved 2022.01 - 10 credit points	
<b>Level 5 - 120 credit points</b>	
<b>Level 5 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 5514USST Modelling and Simulation Approved 2022.01 - 10 credit points	
[MODULE] 5515USST Engineering Mathematics 2 Approved 2022.01 - 20 credit points	
[MODULE] 5516USST Materials and Processes Approved 2022.01 - 10 credit points	
[MODULE] 5517USST Thermodynamics and Fluid Mechanics 2 Approved 2022.01 - 20 credit points	
[MODULE] 5518USST Applied Mechanics 2 Approved 2022.02 - 20 credit points	
[MODULE] 5519USST Engineering Design 2 Approved 2022.01 - 20 credit points	
[MODULE] 5520USST Mechatronics 2 Approved 2022.01 - 20 credit points	
<b>Level 6 - 120 credit points</b>	
<b>Level 6 Core - 80 credit points</b>	<b>CORE</b>
[MODULE] 6556USST Engineering Project Approved 2022.01 - 40 credit points	
[MODULE] 6557USST Industrial Management Approved 2022.02 - 20 credit points	
[MODULE] 6558USST Engineering Design 3 Approved 2022.01 - 20 credit points	
<b>Level 6 Optional - 40 credit points</b>	<b>OPTIONAL</b>
[MODULE] 6559USST Fluid Dynamics & Heat Transfer Approved 2022.01 - 10 credit points	

[MODULE] 6560USST Materials Engineering Approved 2022.01 - 10 credit points
[MODULE] 6564USST Dynamics and Control Approved 2022.01 - 10 credit points
[MODULE] 6565USST Computational Fluid Dynamics Approved 2022.01 - 10 credit points
[MODULE] 6566USST Finite Element Analysis Approved 2022.01 - 10 credit points
[MODULE] 6567USST Sensors and Robotics Approved 2022.01 - 10 credit points

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

## Approved variance from Academic Framework Regulations

Variance
A variance permits the use of more than 2, but not more than four, 10 credit modules at level 6.
The following criteria will apply for students at Level 5, Level 6: Where a module comprises two or more assessment elements (eg examination and coursework), successful completion of the module should require a mark of greater than 10% less than the module pass mark in each element, as well as the overall module mark being above the normal pass mark (40%). This requirement only applies to assessment elements that contribute more than 30% towards the final module mark.

## 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.
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## Opportunities for work related learning

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 vacation. Further, work based learning is included in the curriculum via case studies and a number of students undertake their final year 'engineering projects' with industry involvement.
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## Entry Requirements

Type	Description
Other international requirements	National University Entrance Examinations, Second Level
Alternative qualifications considered	To be enrolled, students should attend national university entrance examinations and pass the line of second level (Normally their scores should be higher than the provincial score of second level). In China, the college entrance outcomes are divided into 3 levels (1st, 2nd, 3rd). Students will be able to demonstrate efficiency in English to a standard equivalent to IELTS 5.5. USST will operate within the guidance of the LJMU Admissions Policy, please see LJMU Code of Practice for Admissions at: <a href="https://www.ljmu.ac.uk/~media/files/ljmu/public-information-documents/student-regulations/guidance-policy-and-process/admissions-policy">https://www.ljmu.ac.uk/~media/files/ljmu/public-information-documents/student-regulations/guidance-policy-and-process/admissions-policy</a>

### Extra Entry Requirements