

Module Specification

Module Summary Information

1	Module Title	Mechanical Science
2	Module Credits	20
3	Module Level	5
4	Module Code	ENG5102

5	Module Overview
<p>The Mechanical Science module applies the principles of engineering, physics, and materials science to the design, analysis, manufacture, and maintenance of mechanical systems and components. It is a branch of engineering that enables you to design, produce, and operate machinery. In keeping with the programme philosophy the module encourages learning through the practical application of fundamental mechanical science principles to the analysis and solution real world problems.</p> <p>The course is delivered by way of an introductory lecture to a particular real world problem, such as vibration, and the underlying mechanical science principles used to tackle the problem. You will then engage in interactive tutorials where you will practice applying underlying mechanical science principles to real world problems.</p> <p>It is in the nature of Mechanical Science that it provides quantitative and objective analysis of mechanical components. It is important therefore that you will be able to demonstrate your ability to analyse and apply underlying principles of mechanical science to real world problems. You will therefore be assessed by a single one and a half hour closed book exam, where you will be able to demonstrate your individual ability to analyse a real world problem, and apply the relevant mechanical science principles to develop a solution to it.</p>	

6	Indicative Content
<p>Structural Annalysis Normal and Shear Stress, Combined Loading, Principal Stresses, Mohr's Stress Circle, Thin-walled Cylinders, Advanced Shear Forces and Bending Moment Diagrams, Macaulay's Method for Determinate Beams under Loading.</p> <p>Failure of Materials Failure Criteria, Tresca and von Mises Criteria, Fatigue.</p> <p>Dynamics Free and Forced Single Degree of Freedom Systems, Balancing of Shafts.</p>	

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Analyse commonly encountered mechanical problems and identify the underlying mechanical science principles required to solve the problem.	
	2	Develop simple analytical mathematical models based upon underlying mechanical science principles to quantitatively evaluate real world mechanical components.	
	3	Make an objective evaluation of functionality of mechanical components based upon the results obtained from the application of underlying mechanical science principles and quantitative mathematical models derived from them.	
8	Module Assessment		
Learning Outcome		Coursework	Exam
1-3		30%	70%
		In-Person	

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	0	
Private Study (PS) includes preparation for exams	152	
Total Study Hours:	200	