Module Specification

Module Summary Information

1	**Module Title**	Advanced Mechanics
2	**Module Credits**	20
3	**Module Level**	6
4	**Module Code**	ENG6084

5	**Module Overview**

Mechanical engineers nowadays solve problems of high and multidisciplinary complexity. Although computational solutions generally lead to reliable results, the engineer should always attempt to validate the findings by alternative methods. This requires a thorough understanding of the underlying problems, but also the approach of reasonable simplification of complex systems without compromising validity.

The module aims to allow you to gain a sound understanding of analytical stress analysis to be able to employ alternative methods to assess numerical predictions.

Learning activities will be predominantly through lectures and tutorials, where practice based problems will be addressed. Laboratories will be used where appropriate to support the understanding of the subject and to strengthen the learned.

6	**Indicative Content**

Deflection of structurally determinate and indeterminate members using Castigliano's theorem, Unit Load method and Macaulay's method
Shear stress distribution in cross-sections due to bending
Bending and Torsion of flexural members of non-symmetrical cross-sections
Plastic deformation of beams with symmetric and non-symmetric cross-sections
Stresses and strains in thick walled and compound cylinders under constant pressure loading
Stress, strain and interference calculations for rotating discs
Stresses and strains in axisymmetric plates in bending

7	**Module Learning Outcomes** **On successful completion of the module, students will be able to:**	
	1	Determine and analyse stresses and deformations in complex engineering components.
	2	Specify and apply appropriate stress analysis techniques in failure analysis and to ensure adequate design.

8	Module Assessment			
Learning Outcome				
	Coursework	**Exam**	**In-Person**
1-2		100%	

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