

## Module Specification

### Module Summary Information

<b>1</b>	<b>Module Title</b>	Design and Materials
<b>2</b>	<b>Module Credits</b>	20
<b>3</b>	<b>Module Level</b>	5
<b>4</b>	<b>Module Code</b>	ENG5100

<b>5</b>	<b>Module Overview</b>
<p>The module provides you with the opportunity to learn about design, sustainable development, teamwork and communication whilst contributing towards real international development projects.</p> <p>You will also gain the ability to communicate design ideas and practical details, to evaluate and apply both tangible and subjective feedback, and to conceive, design, implement and operate practical solutions to design opportunities.</p> <p>It is anticipated that the project vehicle for this module will be the Engineers without Borders Design for People Challenge.</p>	

<b>6</b>	<b>Indicative Content</b>
<p><b>Materials</b>          Metals: Stiffness and weight: Crystal structures. Density calcs, Ductile and brittle failure modes, Metals: Solidification mechanism. Effect of grain size, Metals: Alloying. Equilibrium, Metals: Non-equilibrium Steels, Heat treatment, Polymers: Classification and Structures, Polymers: Adhesives, Ceramics: Industrial ceramics and ceramic coatings, Composites: Basic theory, use of simple simulation, Corrosion resistant materials, Light-weight materials for engineering applications, High-temperature materials for engineering applications.</p> <p><b>CAD</b>          Introduction to engineering project (CDIO), Surface modelling, sweeping techniques, lofting, blending</p>	

<b>7</b>	<b>Module Learning Outcomes</b>
<b>On successful completion of the module, students will be able to:</b>	
<b>1</b>	Apply CAD to the production of complex parts.
<b>2</b>	Communicate innovative design solutions to technical and non-technical audiences.
<b>3</b>	Interpret and analyse practical test results and use to predict material behaviour.
<b>4</b>	Appraise the contexts in which engineering knowledge can be applied and hence demonstrate the ability to work with technical uncertainty.

8 Module Assessment			
Learning Outcome			
	Coursework	Exam	In-Person
1-4	70%		30%

9 Breakdown Learning and Teaching Activities	
Learning Activities	Hours
<b>Scheduled Learning (SL)</b> includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	72
<b>Directed Learning (DL)</b> includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	0
<b>Private Study (PS)</b> includes preparation for exams	128
<b>Total Study Hours:</b>	200