

Module Outline

Part 1- as validated

1.	Title	Computer Simulation and Modelling
2.	Level	6
3.	Credits	20
4.	Indicative Student Study Hours	36 hours lectures 164 hours self-directed learning
5.	Core (must take and pass), Compulsory (must take) or Optional	Optional

5. Brief Description of Module (purpose, principal aims and objectives)

Engineering and manufacturing require the skills and knowledge to bring a concept forward through innovation to physical creation.

This module develops student's prior CAD/CAM and SOLIDWORKS knowledge to evaluate mechanical systems in a variety of settings. This module will link closely to manufacturing theory and practice where parts and systems can be evaluated against their operational targets for sustainable design.

The students will gain experience of computational dynamic simulation software using the ADAMS multi-body dynamics software package.

6. Learning Outcomes - On successful completion of this module a student will be able to:

(Add more lines if required)

	Specific Learning Outcomes
1.	Appraise effectively how engineering software can enhance product design and assess the limitations
2.	Apply successfully a finite element analysis approach to components and systems design and evaluation
3.	Utilise a modern features-based modelling system effectively for the purposes of designing components and assemblies, and employ this as the basis for analysis and simulation using an integrated analysis system
	Generic Learning Outcomes
4.	Take responsibility for own learning and development using reflection and evaluation

5.	Work with ideas and concepts by evaluating information from a range of perspectives
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7. Assessment

Pass on aggregate or Pass all components <i>(modules can only be pass all components if this is a PSRB requirement)</i>	Pass on aggregate
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Summary of Assessment Plan

	Type	% Weighting	Anonymous Yes / No	Word Count/ Exam Length	Learning Outcomes Coverage	Comments
1.	Portfolio of 3D drawing and models;	50 %	No	3 D drawings and models;	LO 1, 2, 3, 5	
2	Critical evaluation	50%	Yes	2000 words	LO 1, 4	

Further Details of Assessment Proposals

Give brief explanation of each assessment activity listed

Portfolio
The student will produce a portfolio of CAD drawings and CAM models to demonstrate their own competence using the software. SOLIDWORKS models will also be included. An animation of the system and components designed will be produced using ADAMS software.

Critical evaluation
The students will evaluate the effectiveness of computer simulation and modelling in an engineering context through a critical evaluation which identifies clearly the selection and decision making process applied while working on the above portfolio.

8. Summary of Pre and / or Co Requisite Requirements

Not applicable

9. For use on following programmes

BEng Engineering (Mechanical)

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Module Specification	Part 2- to be reviewed annually
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1.	Module Leader	John Dorward, Dr Dominic Onimowo
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2.	Indicative Content
	<p>The student undertaking this module will possess some basic knowledge and or experience of CAD/CAM, Autodesk Inventor, and SOLIDWORKS from previous study or work. This module is aimed at further enhancement and development of the student's theoretical understanding and practical skills in a range of CAD/CAM activities.</p> <p>The module will tackle complex sketches including 2D and 3D, feature-based modelling and use of feature library, assembly modelling of complex products and use of library parts, animations of assembly models, surface modelling, analysis of CAD models, Finite Element Analysis (FEA), application of CAD models in CAD/CAM applications, Application of CAD in the product lifecycle, Mechanism Synthesis and Analysis through computational dynamic simulation software using the ADAMS multi-body dynamics software package.</p>

3. Delivery Method <i>(please tick appropriate box)</i>					
Classroom Based	Supported Open Learning	Distance Learning	E-Learning	Work Based Learning	Other (specify)
Yes					
<i>If the Delivery Method is Classroom Based please complete the following table:</i>					
	Activity (lecture, seminar, tutorial, workshop)	Activity Duration - Hrs	Comments	Learning Outcomes	
1	Lectures and workshops	36h		LO 1-5	
	Total Hours	36h			
If delivery method is <i>not</i> classroom based state lecturer hours to support delivery				Two 20 minutes academic tutorials per student per module	

4. Learning Resources <i>To include contextualised Reading List.</i>
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Highly Recommended

Budynas, R.G. and Nisbett, K.J. (2014) *Shingley's Mechanical Engineering Design*. N.L.: McGraw-Hill Education

Tran, P. (2018) *SolidWorks 2018: Advanced Techniques*. N.L.: SDC Publications

Recommended

Akin, J. E. (2010) *Finite Element Analysis Concepts Via SolidWorks*. Hackensack: World Scientific Publishing Co.

Mac Donald, B.J. (2007) *Practical Stress Analysis with Finite Elements*. Dublin: Glasnevin Publishing

Tran, P. (2018) *SolidWorks 2018: Intermediate Skills*. N.L.: SDC Publications

Websites

<http://www.mscsoftware.com/product/adams> [accessed 06/11/2018]

<https://www.solidworks.com> [accessed 06/11.2018]