

Module Code:	ENG494
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Module Title:	Introduction to CAD (Computer Aided Design)
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Level:	4	Credit Value:	10
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Cost Centre(s):	GAME	JACS3 code:	J511
		HECoS code:	100050

Faculty	Faculty of Arts, Science and Technology	Module Leader:	Natalija Vidmer
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Scheduled learning and teaching hours	18 hrs
Guided independent study	82 hrs
Placement	0 hrs
Module duration (total hours)	100 hrs

Guidance - normally, the university would expect to see the following amounts of contact time and independent learning time for taught modules as part of its Modular Curriculum Framework;

<i>Level</i>	<i>Credit volume</i>	<i>Overall learning hours</i>	<i>Contact learning hours</i>	<i>Independent learning hours</i>
<i>Level 4</i>	<i>20 credits</i>	<i>200 hrs</i>	<i>36</i>	<i>164</i>

Programme(s) in which to be offered (not including exit awards)	Core	Option
Stand Alone Module (aligned to BEng Automotive Engineering for QA purposes only)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Pre-requisites
The students must have basic computer skills.

Office use only

Initial approval: 28/05/2019
With effect from: 01/06/2019
Date and details of revision:

Version no: 1
Version no:

Module Aims

The module provides integration of the subject areas of computer aided design and computer aided manufacture. It will enable the student to acquire a broad knowledge of the practical applications of a CAD/CAM system.

Intended Learning Outcomes

Key skills for employability

- KS1 Written, oral and media communication skills
- KS2 Leadership, team working and networking skills
- KS3 Opportunity, creativity and problem solving skills
- KS4 Information technology skills and digital literacy
- KS5 Information management skills
- KS6 Research skills
- KS7 Intercultural and sustainability skills
- KS8 Career management skills
- KS9 Learning to learn (managing personal and professional development, self-management)
- KS10 Numeracy

At the end of this module, students will be able to

Key Skills

1	Produce a 3D solid part using standard CAD techniques such as extrudes, revolves etc	KS1	KS4
		KS3	KS9
2	Create an engineering drawing from a 3D CAD model to be made in a workshop	KS1	KS6
		KS4	KS9
		KS10	
3	Utilise 3D CAD software to produce a component using rapid prototyping	KS3	KS5
		KS4	KS9

Transferable skills and other attributes

To organise study time, to study independently, to learn from feedback;
 To develop skills for use of software languages and interfaces techniques;
 To implement CAD system to design and production;
 To develop skills for using a computer simulation package.

Derogations

None

Assessment:

Indicative Assessment Tasks:

The assessment will be through the development of a CAD representation of a component that can be fabricated on a rapid prototype machine (polymer). The student will need to explain the CAD process and also show knowledge of the 3D printing process.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration or Word count (or equivalent if appropriate)
1	1, 2, 3	Coursework	100%	2000 words

Learning and Teaching Strategies:

Lectures will deliver key concepts, ideas, theories and examples. Teaching delivery is scheduled to be 3 hours per week across 6 weeks.
Tutorials and workshops (lab sessions) will allow the further exploration of the lectures and use exercises to give students the opportunity to investigate, discuss and acquire further subject specific knowledge through individual work.
Self-study exercises and reading are also given.
The assessment for the module will allow students the opportunity to explore key concepts and theories whilst developing an appreciation of 'real-life' issues and situations.
Students will have access to lecture materials and resources, via the University's VLE platform.

Syllabus outline:

- Production of 2D sketches
- Production of 3D models using revolutions and/or extrusions of constant cross sections
- Sweep and blends of models with varying cross sections
- The use of features such as fillets, chamfers and holes
- The use of patterns to create 3D features
- Conversions to STL files and suitability of 3D model for rapid prototyping.
- Different 3D printer methods and applications.

Indicative Bibliography:

Essential reading

N. Brock (2016), *Cad Cam Rapid Prototyping Application Evaluation*, CreateSpace Independent Publishing

Other indicative reading

R. ALavala (2013) *CAD/CAM: Concepts and Applications*, PHI Learning