

<b>Module Details</b>	
<b>Module Title</b>	Computer Aided Engineering
<b>Module Code</b>	ENB4002-B
<b>Academic Year</b>	2022/3
<b>Credit Rating</b>	20
<b>School</b>	Department of Mechanical and Energy Systems Engineering
<b>Subject Area</b>	Engineering Business
<b>FHEQ Level</b>	FHEQ Level 4
<b>Pre-requisites</b>	
<b>Co-requisites</b>	

<b>Contact Hours</b>	
<b>Type</b>	<b>Hours</b>
Online Lecture (Synchronous)	20
Online Tutorials (Synchronous)	30
Interactive Learning Objects	12
Directed Study	138

<b>Availability</b>	

<b>Occurrence</b>	<b>Location / Period</b>
BDA	University of Bradford / Academic Year

<b>Module Aims</b>
<p>The module aims to provide a working understanding of computer aided design, analysis and simulation techniques applicable to Chemical, Civil, Mechanical and Biomedical Engineering through the use of industry standard Computer Aided Engineering software. The developed knowledge and understanding forms the foundation in computer aided engineering methods which will be utilised throughout all stages of study in all engineering disciplines.</p>

<b>Outline Syllabus</b>
<p>The syllabus is divided into 2 core areas (Computer Aided Design and Computation Analysis)</p> <p>which are common to all disciplines. Some discipline specific learning is also included.</p> <p>Computer Aided Design (AutoCAD and SolidWorks) 1. Understanding engineering drawings 2. Fundamentals of 3D geometry modelling 3. Modelling of assemblies 4. Simulation Computational Analysis (MATLAB) 1. Solving engineering mathematical problems 2. Creation and display of graphs and data plots 3. Matrices and vector analysis 4. Data fitting</p> <p>Discipline Specific 1. Chemical Engineering - Plant Design and Plant Arrangement 2. Civil Engineering - Building Information Management (BIM) 3. Mechanical and Medical Engineering - Enhanced discipline specific examples</p>

<b>Learning Outcomes</b>	
01	Select and apply appropriate computational method for the description, analysis and visualisation of engineering problems.
02	Communicate engineering information through appropriate visual means
03	Demonstrate IT and problem solving skills as applied to engineering analysis

## Learning, Teaching and Assessment Strategy

Computer aided engineering (CAE) tools are introduced through the use of practical examples delivered either as live online demonstrations, online tutorial classes and personal or group directed study. Examples are designed to give students a broad experience of the use of CAE tools across all disciplines (Mechanical, Civil, Chemical and Biomedical) as well as methods for selecting appropriate CAE tools for a given engineering problem. Our virtual learning environment (VLE) Canvas will provide access to substantial tutorial material and examples which students complete during the Learning Objects Interaction and Directed Study time outside of timetabled sessions.

Individual and group directed study activities will be formatively assessed during online tutorial sessions. Feedback and guidance will be given to students on an informal basis.

There are 3 formal assessments.

Assessment 1 (Coursework) - 2 and 3D modelling of parts, assemblies, processes and structures (20%)

Assessment 2 (Coursework) - Data analysis and visualisation (40%)

Assessment 3 (Coursework) - 2 and 3D modelling of parts, assemblies, processes and structures (40%)

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This module satisfies the below Learning Outcomes as specified by the Accreditation of Higher Education Programmes: Fourth Edition (AHEP4) as published by the Engineering Council in-line with the UK Standard for Professional Engineering Competence (UK-SPEC). These outcomes specify five key areas of learning which partially (C) or fully (M) meet the academic requirement for CEng registration: Science and Mathematics (1), Engineering Analysis (2-4), Design and Innovation (5-6), The Engineer and Society (7-11), and Engineering Practice (12-18). Further details of these learning outcomes can be found at <https://www.engc.org.uk/ahep/>

C1, M2, C2, C4, M12, C12, M13, C13, C16,

<b>Mode of Assessment</b>				
<b>Type</b>	<b>Method</b>	<b>Description</b>	<b>Weighting</b>	
Summative	Coursework - Artefact	2 and 3D Modelling of Systems Part 1		20%
Summative	Coursework - Artefact	Data analysis and visualisation		40%
Summative	Coursework - Artefact	2 and 3D Modelling of Systems Part 2		40%

<b>Reading List</b>
To access the reading list for this module, please visit <a href="https://bradford.rl.talis.com/index.html">https://bradford.rl.talis.com/index.html</a>

*Please note:*

*This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.*