

Module Details	
Module Title:	Computer Aided Engineering
Module Code:	ENB4002-B
Academic Year:	2019-20
Credit Rating:	20
School:	Department of Mechanical and Energy Systems Engineering
Subject Area:	Engineering Business
FHEQ Level:	FHEQ Level 4
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Lectures	4
Tutorials	69
Directed Study	131

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2 (Feb - May)

Module Aims
<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>

Outline Syllabus
<p>The syllabus is divided into 2 core areas (Computer Aided Design and Computation Analysis) which are common to all disciplines. Some discipline specific learning is also included. Computer Aided Design (AutoCAD and SolidWorks)</p>

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

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

Learning Outcomes

1	Select and apply appropriate computational method for the description, analysis and visualisation of engineering problems.
2	Communicate engineering information through appropriate visual means
3	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 demonstrations, tutorial classes or personal and 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 directed study time outside of timetabled sessions.

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

There are 2 formal assessments.

Assessment 1 (Coursework) - 2 and 3D modelling of parts, assemblies, processes and structures (60%)

Assessment 2 (Lab Test) - Data analysis and visualisation (40%)

Additionally, there are formative assessments throughout the module during timetabled tutorial sessions.

This module satisfies the below Learning Outcomes as specified by the Accreditation of Higher Education Programmes: Third Edition (AHEP3) as published by The Engineering Council in-line with the UK Standard for Professional Engineering Competence (UK-SPEC). These outcomes specify six key areas of learning: Science and Mathematics (SM), Engineering Analysis (EA), Design (D), Economic, Legal, Social, Ethical and Environmental Context (EL), Engineering Practice (P) and Additional General Skills (G).

SM1b, SM3b, EA1b, EA3b, P1, P4, G1, G2, G4, P9m.

Further details of these learning outcomes can be found at <https://www.engc.org.uk/>.

Mode of Assessment				
Type	Method	Description	Length	Weighting
Summative	Coursework	2 and 3D Modelling of Systems	0 hours	60%
Referral	Coursework	3D modelling of systems with data analysis		100%
Summative	Classroom test	Data analysis and visualisation	0 hours	40%

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html .

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.