

## MODULE DESCRIPTOR

### Module Title

Mechanical Design A

Reference	EN2801	Version	1
Created	April 2023	SCQF Level	SCQF 8
Approved	August 2023	SCQF Points	15
Amended		ECTS Points	7.5

### Aims of Module

To enable students to design mechanical systems comprised of different machine elements by using the standard CAD software and computer programming

### Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Design integrated multi-element mechanical systems suitable for performing a complex engineering task.
- 2 Create a mathematical model to perform design calculations using engineering principles.
- 3 Apply 3D modelling techniques to model the designed mechanical system using a standard CAD software.
- 4 Discuss quality management concepts to improve the designed system in preparation for manufacturing.

### Indicative Module Content

The student will develop an understanding of the engineering design and related management decisions in a global context. The student, either individually will be required to research and design to form a range of potential solutions to a mechanical problem using engineering tools such as CAD, design calculations for machine elements, mathematical programme, iterative design process, practical fabrication techniques and its limitations, risk mitigation techniques, overall quality management practices at system/organisation level.

### Module Delivery

This is a studio/workshop-based module supplemented by lectures and tutorials.

### Indicative Student Workload

	Full Time	Part Time
Contact Hours	35	35
Non-Contact Hours	115	115
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

**ASSESSMENT PLAN**

If a major/minor model is used and box is ticked, % weightings below are indicative only.

**Component 1**

Type: Coursework Weighting: 100% Outcomes Assessed: 1, 2, 3, 4  
 Description: Portfolio of evidence - interim assessment

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

Component 1 comprises 100% of the module grade. To pass the module, a D grade is required.

Module Grade	Minimum Requirements to achieve Module Grade:
<b>A</b>	A
<b>B</b>	B
<b>C</b>	C
<b>D</b>	D
<b>E</b>	E
<b>F</b>	F
<b>NS</b>	Non-submission of work by published deadline or non-attendance for examination

**Module Requirements**

Prerequisites for Module EN1601 Product Development or its equivalent.  
 Corequisites for module None.  
 Precluded Modules None.

**INDICATIVE BIBLIOGRAPHY**

- 1 SIMMONS, C.H., 2020. Manual of engineering drawing: technical product specification and documentation to British and international standards. Amsterdam: Butterworth-Heinemann
- 2 KAUSHIK, K., ZINDANI, D., DAVIM, J.P., 2020. Mastering SolidWorks- Practical Examples. Cham: Springer International Publishing AG
- 3 BUDYNAS, R.G. and NISBETT, J.K., 2019. Shigley's Mechanical Engineering Design. 11th ed. New York, NY: McGraw-Hill.
- 4 NAGAR, S., 2017. Introduction to MATLAB for engineers and scientists: solutions for numerical computation and modelling. Berkley, CA: Apress L.P.
- 5 HAHN, B.H., VALENTINE, D.T., 2017. Essential MATLAB for Engineers and Scientists. 6th ed. Saint Louis: Elsevier.
- 6 ASHBY, M., SHERCLIFF, H. and CEBON, D., 2013. Materials. 3rd ed. Oxford: Butterworth-Heinemann.
- 7 KLEBANOV, B.M., 2009. Machine Elements, Life and Design. Boca Raton, FL: CRC Press