

## MODULE DESCRIPTOR

### Module Title

Engineering Analysis 2

Reference	EN4500	Version	4
Created	August 2021	SCQF Level	SCQF 10
Approved	March 2004	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

### Aims of Module

To provide the student with the ability to analyse and predict the behaviour of engineering components and systems

### Learning Outcomes for Module

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

- 1 Recognise and explain the fundamental principles of finite element methods and use finite element methods to analyse static structures.
- 2 Apply reliability techniques to engineering components and systems and evaluate outcomes.
- 3 Interpret the vibrational behaviour of complex systems.
- 4 Understand and analyse the behaviour of shrink fit and compound cylindrical components.

### Indicative Module Content

Introduction to finite element analysis; application of FE methods in the solution of static 2D problems; vibration analysis of multi degree-of-freedom and continuous systems to periodic and transient loading; reliability analysis of repairable and non-repairable systems; shrink fits; compound cylinders.

### Module Delivery

Module delivered by means of lectures, tutorials and self-guided study, integrated with computer-based applications.

### Indicative Student Workload

	Full Time	Part Time
Contact Hours	50	50
Non-Contact Hours	100	100
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: 30% Outcomes Assessed: 1  
 Description: Coursework assessment using FEA theory and software.

#### Component 2

Type: Examination Weighting: 70% Outcomes Assessed: 2, 3, 4  
 Description: Closed book examination.

### MODULE PERFORMANCE DESCRIPTOR

#### Explanatory Text

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 30% and C2 is worth 70%.

		Coursework:						NS
		A	B	C	D	E	F	
Examination:	A	A	A	B	B	E	E	
	B	B	B	B	C	E	E	
	C	B	C	C	C	E	E	
	D	C	C	D	D	E	E	
	E	E	E	E	E	E	F	
	F	F	F	F	F	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination						

#### Module Requirements

Prerequisites for Module Engineering Analysis 1 (EN3501)  
 Corequisites for module None.  
 Precluded Modules None.

#### ADDITIONAL NOTES

An Indicative Bibliography will normally reference the latest edition of a text. In some cases, older editions are equally useful for students and therefore, those are the editions that may be stocked.

**INDICATIVE BIBLIOGRAPHY**

- 1 FAGAN, M.J., 1992. Finite Element Analysis : Theory and Practice. Harlow: Longman.
- 2 O'CONNOR P.D.T., 2011. Practical Reliability Engineering. 5th ed. Chichester: J Wiley & Sons.
- 3 DAVIDSON, J. and HUNSLEY, C., 1994. The Reliability of Mechanical Engineering Systems. London: Mechanical Engineering Publications.
- 4 KELLY S.G., 2012. Mechanical Vibrations: Theory and Applications (SI edition). Cengage Learning.
- 5 RAO, S.S., 2016, Mechanical Vibrations. 6th ed. Pearson Prentice Hall.