Module Title **Engineering Analysis 2** **Keywords** Finite element method, vibration analysis of discrete and continuous systems, digital signal processing, reliability engineering.	Reference EN4500 SCQF SCQF Level 10 SCQF Points 15 ECTS Points 7.5 Created July 2002 Approved March 2004 Amended August 2011 Version No. 2

This Version is No Longer Current

The latest version of this module is available here

Prerequisites for Module

Engineering Analysis 1 (EN3501)
Signal Acquisition, Instrumentation and Control (EN3500)

Corequisite Modules

None.

Precluded Modules

None.

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

Mode of Delivery

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

Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2
Component 2	3,4,5

Component 2 is a closed book examination (70% weighting).

Component 1 is a coursework assessment using FEA software and theory (30% weighting).

Indicative Bibliography

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

1. Recognise and explain the fundamental princples of finite element methods.
2. Use finite element methods to analysis static structures.
3. Apply reliability techniques to engineering components and systems and evaluate outcomes.
4. Utilise sampling and Fourier analysis methods to determine the characterisitics of engineering components and systems.
5. Interpret the vibrational behaviour of complex systems.

Indicative Module Content

Introduction to finite element analysis; application of FE methods in the solution of static 2D beam problems; vibration analysis of multi degree-of-freedom and continuous systems to periodic and transient loading; signal sampling and processing methodologies; reliability analysis of repairable and non-repairable systems.

Indicative Student Workload

Contact Hours	Full Time	Part Time
Assessment	11	11
Lectures	26	26

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.

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.

Tutorials	13	13
Directed Study		
Coursework preparation	30	30
Directed Self-Study	35	35
Private Study		
Private Study	35	35