Module Code	MEU44B11
Module Name	Engineering Vibration and noise
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Dr. John Kennedy
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should be able to: LO1. apply the principles of vibration isolation to design solutions for common problems faced by noise and vibration engineers; LO2. analyse and recognize multi-degree of freedom systems and apply modal methods to their solution; LO3. model and analyse continuous systems; LO4. understand the problems associated with the analysis of non-linear vibrating systems; LO5. assess noise and vibration exposure in the workplace; LO6. apply industry standard metrics for noise and vibration monitoring; LO7. predict vibration properties of systems using finite elements; LO8. perform noise and vibration measurements and compare the results with those obtained by the analytical and numerical methods developed in the course. **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Enhanced To communicate effectively - Enhanced
Module Content	Engineering systems often experience problems associated with unwanted vibration or noise which may lead to failure of physical components or complaints from communities exposed to these systems. This module will provide the student with a fundamental understanding of the problem of vibration as well as the experimental and numerical tools necessary to model and analyse vibration problems in engineering systems. The module will introduce the industry standard approaches to noise and vibration control which require analysis during the design phase as well as during the

	use of these systems.
Teaching and Learning Methods	This module lecture programme is supplemented by a detailed laboratory experiment which makes use of a variety of vibration instrumentation including accelerometers, microphones and laser vibrometry. The laboratory work is augmented by finite element modelling of the measured system using commercial and custom vibration analysis software. Students will prepare a formal report on the experimental and numerical analysis of the vibrating system. The module makes use of a blended learning environment, including online discussion forums, to aid the weekly tutorials. These tutorials focus on common problems facing noise and vibration control engineers.

Assessment Details[2]
Please include the following:

- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

Assessment Component	Assessment Description	LO Addressed	% of total	Week due
Written examination	End of semester examination	1-8	75	Exam period
Assignment	Combined experimental and numerical evaluation of a practical vibrating system	1-8	25	Week 10

Reassessment Requirements

Written Examination

Contact Hours and Indicative Student Workload[2]

Contact hours: **Lectures - 33 hours** **Tutorials (Online) – 11 hours**
Independent Study (preparation for course and review of materials): 33 hours (one hour per lecture)
Independent Study (preparation for assessment, incl. completion of assessment): 44 hours

Recommended Reading List

- Engineering Vibration, DJ Inman, Prentice Hall
- Mechanical Vibrations, SS Rao, Pearson/Prentice-Hall
- Theory of Vibration with Applications, WT Thomson, Chapman & Hall

Module Pre-requisite

NA

Module Co-requisite

NA

Module Website

Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.

No

Module Approval Date

Approved by

Academic Start Year

Academic Year of Date