Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	INTRODUCTION TO VIBRATION ANALYSIS
Unit ID:	ENGIN3302
Credit Points:	15.00
Prerequisite(s):	(ENGIN2302)
Co-requisite(s):	Nil
Exclusion(s):	(ENMEC3120)
ASCED:	030701

Description of the Unit:

This unit introduces students to the aspects of mechanical vibration in a mathematical and theoretical context. The unit will employ experimental methods to highlight the concepts presented.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	**6**	**7**	**8**	**9**	**10**
Introductory						
Intermediate						
Advanced			✔			

Learning Outcomes:

On successful completion of the unit the students are expected to be able to:

Knowledge:

K1. Describe the behaviour of dynamic systems in the time domain.
K2. Explain the transient response of vibrating system.
K3. Relate experimental findings to the analytical model and system variables.
K4. Describe dynamic systems in the frequency domain.
K5. Discuss how vibration systems respond to a harmonic excitation.

Skills:

S1. Demonstrate how computer algebra systems are employed for modelling and simulation.
S2. Solve real engineering problems through symbolic, numeric and experimental dynamic analysis.
S3. Evaluate analytical models and reflect on practice.
S4. Work effectively, both independently and in teams.
S5. Present findings in manners which can be appreciated by professional and lay people.

Application of knowledge and skills:

A1. Test and evaluate an existing vibrating system.
A2. Apply dynamic analysis techniques to a variety of real engineering applications.
A3. Apply existing and developing knowledge and experience to the modelling and analysis of a variety of dynamic engineering systems.

Unit Content:

Topics may include:

- Mathematical background (linearization and Laplace Transforms)

- Mathematical description of mechanical systems

- Transient and free vibration

- Harmonically-Forced Vibration System and Resonance

- Vibration Isolation and Measurement

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K5, S1-S5, A1-A3	A modelling exercise based on a real-world problem that exposes the student to numerical modelling techniques.	Numerical project	40 - 60%
K1 - K5, S3	Assessment of all or part of the unit by examination.	Examination	40 - 60%

Alignment to the Minimum Co-Operative Standards (MiCS)

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a Course level. Although Units must undertake MiCS mapping, there is NO expectation that Units will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry
4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS Course level reporting highlights how each Course embraces the principles and practices associated with the Co-Operative Model. Evidence of Course alignment with the MiCS, can be captured in the Course Modification Form.

MICS Mapping has been undertaken for this Unit   No

Date:

Adopted Reference Style:

Other (IEEE: Refer to the library website for more information)

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)