Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: MACHINE DYNAMICS AND VIBRATION

Unit ID: ENGIN4301

Credit Points: 15.00

Prerequisite(s): (ENGIN3302 or equivalent)

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 030701

Description of the Unit:

This unit equips participants with advanced theoretical and technical knowledge and skills in the area of Mechanical Vibration. After having, successfully, completed the unit, participants will be qualified to undertake highly-skilled engineering work and engage in further learning and research

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						

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

Learning Outcomes:

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

Knowledge:

K1. Investigate and explain how advanced mathematical and numerical methods are employed in the field of machine dynamics and vibration.

K2. Explain the principles and concepts underlying the technical field of machine dynamics.

K3. Explain and differentiate research methods and analytical tools applied in the field of machine dynamics.

K4. Evaluate the operating and design parameters which impact the performance of machinery.

Skills:

S1. Evaluate and transform information relevant to field of machine dynamics.

S2. Work independently and in teams to identify and provide solutions to complex problems in the field of machine dynamics and mechanical vibration.

S3. Apply advanced understanding of the body of knowledge and theoretical concepts underlying the field of machine dynamics.

S4. Communicate knowledge and ideas to a variety of audiences.

Application of knowledge and skills:

A1. Exercise critical thinking and judgement in developing new understanding of machinery dynamics and creatively synthesise solutions for dynamics problems.

A2. Plan and execute a project work in the area of machine dynamics and research with some independence.

A3. Demonstrate responsibility for own learning practice and in collaboration with others.

A4. Adapt knowledge and skills acquired in the unit in diverse engineering and industrial contexts.

Unit Content:

Topics may include:

- Revision of the basic vibration concepts: single degree of freedom.
- Vibration of two and higher degree of freedom systems.
- Mechanical absorber and vibration elimination
- Dynamic effects in rotating machinery (out of balance masses and correction)
- Vibration and Safety

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K4, S1-S4, A1-A4	Research-based design project incorporating numerical and conceptual tasks.	Report	40 - 60%
K1, K2, K4, S1, S3	Assessment of all or part of the unit by examination.	Test and/or Examination	40 - 60%

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