Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Engineering Dynamics

Unit ID: ENGRG2303

Credit Points: 15.00

Prerequisite(s): (ENGRG1002)

Co-requisite(s): Nil

Exclusion(s): (ENGIN2302)

ASCED: 030701

Description of the Unit:
Within mechanical engineering, the understanding of how objects move and interact is fundamental to the design of engineering systems. This unit further develops the concepts of Newtonian mechanics which were introduced in the first-year physics unit. These concepts are the foundation of the field of engineering dynamics. The unit features an application-based treatment in order for students to be able to readily assimilate the theory and concepts introduced.

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. Describe the concepts of particle and rigid body as used in engineering dynamics.

K2. Explain the kinematics of particles in various coordinates.

K3. Describe the kinetics of particles and rigid bodies.

Skills:

S1. Model the behaviour of mechanical systems mathematically.

S2. Communicate your work to others in a clear and scientific manner.

S3. Explain how mathematics is used to model the behaviour of dynamical systems.

Application of knowledge and skills:

A1. Apply mathematical modelling to rigid body kinetics

A2. Use mathematical methods to predict the performance of dynamical systems.

Unit Content:

Topics may include:

- Revision of rectilinear and curvilinear motion
  Kinematics of a particle
  - rectangular coordinates
  - normal and tangential coordinates
  - polar coordinates
- Relative motion
- Kinetics of a particle
  - F = ma
  - work and energy
  - impulse and momentum
- Mass moment of inertia
- Kinetics of a rigid body
  - F = m.a
  - Work & Energy
- Introduction to vibration system and vibration analysis.

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1 - K3, S1 - S3	Within the unit the assigned tutorial questions will form part of the assessed work.	Assessed tutorial problems, quizzes, short Q&As.	10 - 20%
S1 - S3, A1 - A2	A practical laboratory based exercise and/or project will be undertaken during the unit.	Laboratory reports and/or demonstrations.	10 - 30%

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1 - K3, S1	Assessment of all or part of the email via examination.	Examination, final test.	40 - 60%

Adopted Reference Style:

IEEE

Refer to the library website for more information

Fed Cite - referencing tool