

Unit Outline (Higher Education)

Institute / School:	Institute of Innovation Science and Sustainability
Unit Title:	Engineering Mechanics
Unit ID:	ENGIN1005
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	(ENCOR1000 and ENCOR1021 and GPENG1005)
ASCED:	039999

Description of the Unit:

Within all engineering disciplines there are some core concepts that underpin our knowledge as practising engineers. This unit introduces students to the principles engineers use to analyse stationary and moving systems. In order to achieve this the unit will introduce you to the fundamental modelling techniques used by engineers to assess the core static and dynamic engineering systems so that at the end of the unit you will be able to design simple systems that are safe.

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	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

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

Knowledge:

- K1.** Develop a comprehensive understanding of objects in equilibrium and Newton's laws of motion
- K2.** Understand and utilize concepts of centre of gravity and second moment of areas
- K3.** Explain and justify the effects of deviations from ideal behaviour in systems of interacting bodies/structures in equilibrium

Skills:

- S1.** Construct free-body diagrams of objects subjected to forces, moments and distributed loads
- S2.** Build appropriate mathematical models for the analysis of static and dynamic systems.
- S3.** Synthesise solutions for engineering mechanics problems.

Application of knowledge and skills:

- A1.** Apply appropriate engineering and mathematical techniques to analyse simple static and dynamic physical systems.
- A2.** Perform laboratory experiment to observe the behaviour of structural members under given conditions, conduct theoretical and comparative analyses, and write an experiment report.

Unit Content:

Topics may include:

- Constant acceleration motion and Newton's laws
- Simple harmonic motion
- Momentum, inertia and friction
- Equilibrium of rigid bodies
- Centre of gravity, centroid, moments of inertia and area
- Internal forces of structural members and trusses
- Shear force and bending moment diagrams

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2 and K3, S1, S2 and S3, A1	Actively participate in all learning activities including attendance and participation in classes, exercises, recommended and supplementary readings or other activities.	Assessed Tutorial or Online quiz or class test(s)	20 - 30%
K4, S3, A2	Undertake laboratory experiment to validate theoretical engineering concepts in a practical setting	Report on laboratory experiment	10% - 20%
K1, K2 and K3, S1, S2 and S3, A1	Actively participate in all learning activities including attendance and participation in classes, exercises, recommended and supplementary readings or other activities.	Examination(s)/test(s)	40% - 60%

Adopted Reference Style:

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

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

Fed Cite - [referencing tool](#)