Course Outline (Higher Education)

Institute / School: Institute of Innovation Science and Sustainability

Course Title: ENGINEERING MECHANICS

Course ID: ENGIN1005

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): (ENCOR1000 and ENCOR1021)

ASCED: 039999

Description of the Course:

Within all engineering disciplines there are some core concepts that underpin our knowledge as practising engineers. This course introduces students to the principles engineers use to analyse stationary and moving systems. In order to achieve this the course 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 course 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 course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory			✔			
Intermediate						

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Advanced						

Learning Outcomes:

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

Knowledge:

K1. Develop a comprhensive 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.

Course 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

Values:

V1. Appreciate the role and limitations of physical laws and mathematical models in the analysis of real physical situations of relevance to engineering

Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1, K2, K3 and K4, S1, S2 and S3, A1	1 and 3
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	Not applicable	Not applicable
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	Not applicable	Not applicable
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	A2	2
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Learning 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