

Course Outline (Higher Education)

Institute / School: Global Professional School

Course Title: ENGINEERING MECHANICS

Course ID: GPENG1005

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): Nil

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 students to the fundamental modelling techniques used by engineers to assess the core static and dynamic engineering systems. By the end of the course students will be able to design simple, safe systems.

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	<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 course the students are expected to be able to:

Knowledge:

- K1.** Identify and understand force systems, centre of gravity, second moment of area and moment of inertia.
- K2.** Apply free-body diagrams and analyse stress and strain.
- K3.** Understand the Newtonian laws governing the motion of bodies.

Skills:

- S1.** Develop appropriate mathematical methods for the analysis of static systems.
- S2.** Develop appropriate mathematical methods for the analysis of dynamic systems.
- S3.** Use appropriate methods to solve engineering mechanics problems.
- S4.** Develop the appropriate English language and academic skills to successfully study at an undergraduate level.

Application of knowledge and skills:

- A1.** Analyse simple static and dynamic physical systems.
- A2.** Apply engineering principles in the analysis of experimental outcomes and in simple design situations.

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-K3, S1-S3, A1, A2	AT1-AT3
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.	K1-K3, S1-S4, A1, A2	AT1-AT3
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.	K1-K3, S1-S3, A1, A2	AT1-AT3

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1 - K3, S1 - S4, A1 - A2	Actively participate in all learning activities including attendance and participation in classes, exercises, recommended and supplementary readings or other activities.	Online quiz and class test(s)	20 - 30%
K1 - K3, S1 - S4, A1 - A2	Relate fundamental knowledge of engineering mechanics to real-life observations	Report	10% - 20%
K1 - K3, S1 - S4, A1 - A2	An examination(s)/test(s) on any or all of the material covered in the course.	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](#)