



Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	MACHINE DYNAMICS AND VIBRATION
Course ID:	ENGIN4301
Credit Points:	15.00
Prerequisite(s):	ENGIN3302 or equivalent
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	030701

Description of the Course:

This course equips participants with advanced theoretical and technical knowledge and skills in the area of Mechanical Vibration. After having, successfully, completed the course, 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 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	<input type="checkbox"/>	<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 checked="" 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.** Explain how advanced mathematical and numerical methods are employed in the field of machine dynamics and vibration.
- K2.** Describe the principles and concepts underlying the technical field of machine dynamics.
- K3.** Explain research methods and analytical tools applied in the field of machine dynamics.
- K4.** Describe the operating and design parameters which impact the performance of machinery.

Skills:

- S1.** Analyse critically, evaluate and transform information relevant to field of machine dynamics.
- S2.** Work independently to identify and provide solutions to complex problems in the field of machine dynamics and mechanical vibration.
- S3.** Demonstrate advanced understanding of a 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 course in diverse engineering and industrial contexts.

Course Content:

Topics may include:

- Revision of the basic vibration concepts: single degree of freedom.
- Vibration of two degree of freedom systems.
- Dynamics of multi-degree of freedom dynamic systems.
- Vibration elimination in mechanical systems.
- Introduction to continuous systems.

Values:

- V1.** Recognise that all industrial systems, and machine systems in particular, represent complex dynamic systems.
- V2.** Appreciate the significance of research and problem-solving skills for further learning and understanding of complex engineering systems.
- V3.** Recognise the importance of communication skills to professional engineers.

Graduate Attributes

The Federation University FedUni 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-K4, S1-S3, A1	AT1, AT2, 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.	K1-K4, S1-S3, A1-A4	AT2
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.	K4, S4, A3	AT1, AT2, AT3
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.	K2, K4, S4	AT1, AT2, 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, S1-S4, A1-A4	AT2

Learning Task and Assessment:

Learning Outcomes Assessed	Learning 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 course by examination.	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](#)