



Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Advanced Machine Design

Unit ID: ENGRG9303

Credit Points: 15.00

Prerequisite(s): (ENGRG2301)

Co-requisite(s): Nil

Exclusion(s): (ENGIN5301)

ASCED: 030701

Description of the Unit:

This unit qualifies participants to apply an advanced body of knowledge in the area of Machine Design and equips them with highly developed skills for research and enquiry. As such, the unit presents advanced professional and scholarly platforms for further learning and development.

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"/>	<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 checked="" type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:
Knowledge:

- K1.** Analyse and explain complex theory and processes related to integrating whole-of-system design.
- K2.** Recall and appraise design principles in a mechanical engineering setting.
- K3.** Investigate the concepts of efficiency and reliability in machine systems.

Skills:

- S1.** Demonstrate mastery of theoretical and applied methods in the area of machine design.
- S2.** Synthesise and select appropriate designs for machine systems.
- S3.** Construct technical and theoretical findings and demonstrate these to an audience.
- S4.** Demonstrate independent learning with an aptitude for further enquiry and development.

Application of knowledge and skills:

- A1.** Apply highly developed creativity and initiative to tackle new and emerging problems.
- A2.** Demonstrate self-reliance and autonomy in problem solving of technical and research-based projects.
- A3.** Design complex mechanical systems both independently and in teams to produce professional level outcomes

Unit Content:

Topics may include:

- Fatigue considerations in machine design.
- Failure theories and analysis.
- Surface failure and lubrication.
- Reliability analysis.
- Design optimisation.
- Sustainability in mechanical design.

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3, S1-S4, A1-A3	Conduct a major design project and present the outcome, in writing and graphically.	Report	50% - 60%
K1 and K3, S1 - S4, A1 and A3	Scheduled class meetings	Progress mark	10%-20%
K1 - K3, S1-S4, A1 - A3	Demonstrate design and project findings	Oral test	20%-30%

Adopted Reference Style:

IEEE

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

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