



# Unit Outline (Higher Education)

<b>Institute / School:</b>	Institute of Innovation, Science & Sustainability
<b>Unit Title:</b>	Mechanism and Machine Theory
<b>Unit ID:</b>	ENGRG2305
<b>Credit Points:</b>	15.00
<b>Prerequisite(s):</b>	(MATHS2100)
<b>Co-requisite(s):</b>	Nil
<b>Exclusion(s):</b>	(ENGIN2303)
<b>ASCED:</b>	030701

## Description of the Unit:

Within mechanical and mechatronics engineering the motion and control of mechanisms is fundamental to designing machines that move. In this unit students will be introduced to the basic concepts and mathematical models employed to simulate how machines and mechanisms respond to different stimuli. By the end of the unit students will be skilled to undertake linkage design and analysis tasks both individually and in teams.

**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 checked="" 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.** Explain how linkages are designed and integrate them successfully into machine system assemblies.
- K2.** Describe dynamic models of mechanisms on the basis of the desired performance criteria.
- K3.** Describe how computers are employed for mechanism design and analysis.

**Skills:**

- S1.** Analyse and synthesise machine components and subassemblies, and integrate them successfully into machine system assemblies.
- S2.** Design and analyse typical machines and drives.
- S3.** Predict dynamic characteristics and operating conditions of machines and drives.
- S4.** Apply advanced computer aided engineering techniques to the design and analysis of machines and drives.

**Application of knowledge and skills:**

- A1.** Apply advanced computer aided engineering techniques to the design and analysis of machines and drives.
- A2.** Present findings in textual, graphical and mathematical formats.

**Unit Content:**

Topics may include:

- Mobility and kinematics of linkages
- Computer-aided mechanism analysis
- Motion generation and control via cam-follower systems
- Power transmission and flywheel design
- Introduction to robotics: planar manipulators

**Learning Task and Assessment:**

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K3, S1, S3, S4, A1, A2	A detailed design of a machine or mechanism will be undertaken in a group.	Project report	20 - 30%
K2, K3, S2	Within the unit a range of tutorial problems will be submitted for assessment.	Report containing solutions to specified problems	20 - 30%
S1, S2, K1, K2	Assessment of all or part of the unit by examination.	Test	40 - 60%

**Adopted Reference Style:**

IEEE

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

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