

# MECH 3006 MECHATRONIC DESIGN

**Credit Points** 10

**Legacy Code** 300487

**Coordinator** Karthick Thiyagarajan ([https://directory.westernsydney.edu.au/search/name/Karthick Thiyagarajan/](https://directory.westernsydney.edu.au/search/name/Karthick%20Thiyagarajan/))

**Description** Through practical lab exercises and a design project, students will integrate basic skills of mechanics, mechanical systems, and automation in the practice of engineering design (Design for X and system engineering) as applied to mechatronic devices and systems. Students will perform detailed design analysis on important machine elements such as bearings, brakes, clutches, shaft, motor and to integrate those elements to form an automatic mechatronic system is the intended outcome of undertaking this unit. The project-based tasks incorporated into this program build team work experience as well as each student's individual capabilities.

**School** Eng, Design & Built Env

**Discipline** Mechanical and Industrial Engineering and Technology, Not Elsewhere Classified.

**Student Contribution Band** HECS Band 2 10cp

Check your fees via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 3 subject

**Pre-requisite(s)** MECH 2003

**Equivalent Subjects** LGYA 5708 - Mechatronic Design 1 LGYA 5709 - Mechatronic Design 2

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Critically discuss how mechanical/mechatronic design concepts are applied in an industrial context
2. Design main machine elements, such as bearings, shaft, linear motion element and motion control elements
3. Design solutions for automatic mechanical/mechatronic systems
4. Undertake a design of typical mechanical/mechatronic systems including the selection of components in senses of system engineering and design for X
5. Design an integrated mechanical/mechatronic system in a project-based environment
6. Work in a team for a project in designing and building a mechanical/mechatronic device

## Subject Content

System Engineering Approach and Theory for Engineering Design  
Principles and Applications of Design for X (Disassembly, Environment, Recycling, and Fatigue) in Product Design  
Tolerances and Fits  
Shaft Design  
Design of Bearings  
Design of Linear Motion Elements  
Electric Motors and Controls  
Design of Automatic Mechatronic System  
Brakes and Clutches

Project-based design of integrated mechanical/mechatronic systems including selection of suitable components

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group	Mandatory Task
Short Answer	2,000 words (each)	30	N	Individual	Y
Report	8,000 – 10,000 words	40	Y	Group	Y
Presentation	3 minutes	10	N	Individual	Y
Log/Workbook	800 words (each)	20	N	Individual	Y

Prescribed Texts

- Mott, RL 2014, Machine elements in mechanical design, 5th edn, Pearson, Boston
- Ulrich, KT & Eppinger, SD 2012, Product design and development, 5th edn, McGraw-Hill/Irwin, New York, NY.

Teaching Periods

## Sydney City Campus - Term 1 (2024)

### Sydney City

**On-site**

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## Spring (2024)

### Penrith (Kingswood)

**On-site**

**Subject Contact** Karthick Thiyagarajan ([https://directory.westernsydney.edu.au/search/name/Karthick Thiyagarajan/](https://directory.westernsydney.edu.au/search/name/Karthick%20Thiyagarajan/))

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## Parramatta City - Macquarie St

**On-site**

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## Sydney City Campus - Term 3 (2024)

### Sydney City

**On-site**

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