MECH 3006 MECHATRONIC DESIGN

Credit Points 10

Legacy Code 300487

Coordinator Richard Yang (https://directory.westernsydney.edu.au/search/name/Richard Yang/)

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 Vehicle Mechanics

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the 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.

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

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

Sydney City

Day

Subject Contact Peter Lendrum (https://directory.westernsydney.edu.au/search/name/Peter Lendrum/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3006_22-SC1_SC_D#subjects)

Spring

Penrith (Kingswood)

Day

Subject Contact Richard Yang (https://directory.westernsydney.edu.au/search/name/Richard Yang/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3006_22-SPR_KW_D#subjects)

Parramatta - Victoria Rd

Day

Subject Contact Richard Yang (https://directory.westernsydney.edu.au/search/name/Richard Yang/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3006_22-SPR_PS_D#subjects)

Sydney City Campus - Term 3

Sydney City

Day

Subject Contact Peter Lendrum (https://directory.westernsydney.edu.au/search/name/Peter Lendrum/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3006_22-SC3_SC_D#subjects)