

MECH 3008 THERMODYNAMICS AND HEAT TRANSFER

Credit Points 10

Legacy Code 300760

Coordinator Ming Zhao ([https://directory.westernsydney.edu.au/search/name/Ming Zhao/](https://directory.westernsydney.edu.au/search/name/Ming%20Zhao/))

Description This subject introduces students to the fundamentals of thermodynamics which involves energy in the form of heat and heat transfer. Students explore the basic laws and properties of thermodynamics to discover how energy is converted and transferred. Students will apply their knowledge to evaluate power and refrigeration cycles, industrial devices, as well as to design a simple industrial device.

School Eng, Design & Built Env

Discipline Mechanical Engineering

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) MATH 1019 AND ENGR 1011 OR ENGR 1028

Learning Outcomes

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

1. Describe thermodynamic systems and the associated heat transfer processes
2. Illustrate the concepts of thermodynamic parameters and processes
3. Explain thermodynamic relations
4. Apply thermodynamic principles to evaluating power and refrigeration cycles
5. Explain the nature of heat transfer processes
6. Apply heat transfer principles to design and evaluation of simple industrial device

Subject Content

Properties of thermodynamic systems
Laws of thermodynamics
Concepts of energy, work, heat and entropy
Thermodynamic relations
Reversible and irreversible processes
Power and refrigeration cycles
Heat conduction
Natural and forced convection
Radiation heat transfer
Heat exchangers

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 Task
Quiz	15 minutes (per Quiz)	15	N	Individual
Numerical Problem Solving	2 hours (per class)	5	N	Individual
Practical	2,000 word (each)	30	N	Individual
Final Exam	2 hours	50	N	Individual

Teaching Periods

Sydney City Campus - Term 1 (2022)

Sydney City

Day

Subject Contact Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3008_22-SC1_SC_D#subjects)

Spring (2022)

Penrith (Kingswood)

Day

Subject Contact Ming Zhao ([https://directory.westernsydney.edu.au/search/name/Ming Zhao/](https://directory.westernsydney.edu.au/search/name/Ming%20Zhao/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3008_22-SPR_KW_D#subjects)

Parramatta - Victoria Rd

Day

Subject Contact Ming Zhao ([https://directory.westernsydney.edu.au/search/name/Ming Zhao/](https://directory.westernsydney.edu.au/search/name/Ming%20Zhao/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3008_22-SPR_PS_D#subjects)

Sydney City Campus - Term 3 (2022)

Sydney City

Day

Subject Contact Ming Zhao ([https://directory.westernsydney.edu.au/search/name/Ming Zhao/](https://directory.westernsydney.edu.au/search/name/Ming%20Zhao/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3008_22-SC3_SC_D#subjects)

Sydney City Campus - Term 2 (2023)

Sydney City

On-site

Subject Contact Eileen An ([https://directory.westernsydney.edu.au/search/name/Eileen An/](https://directory.westernsydney.edu.au/search/name/Eileen%20An/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MECH3008_23-SC2_SC_1#subjects)

Spring (2023)

Penrith (Kingswood)

On-site

Subject Contact Ming Zhao (https://directory.westernsydney.edu.au/search/name/Ming_Zhao/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MECH3008_23-SPR_KW_1#subjects)

Parramatta City - Macquarie St

On-site

Subject Contact Ming Zhao (https://directory.westernsydney.edu.au/search/name/Ming_Zhao/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MECH3008_23-SPR_PC_1#subjects)