

MECH 3007 THERMAL AND FLUID ENGINEERING

Credit Points 10

Legacy Code 300759

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

Description The unit provides an understanding of thermo-fluid principles and their engineering applications related to thermal processes and energy conversion used in power plants, heat pumps, wind turbines, and airplanes. Students analytical skills are developed through the evaluation of laminar, turbulent and compressible fluid flows, as well as combustion processes and products. Students are introduced to special thermal and fluid engineering topics, including alternative energy options for Indigenous Australians. In addition to examining the theoretical principles, students evaluate thermodynamic systems and apply basic computational techniques to solve thermodynamics and fluid flow problems in practical laboratory sessions.

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) CIVL 2003 AND MECH 3008

Assumed Knowledge

Fundamentals on Fluid Mechanics, Thermodynamics, and Heat Transfer.

Learning Outcomes

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

1. Analyse laminar, turbulent and compressible flows
2. Analyse combustion processes and products
3. Perform basic design selection of pumps and turbines
4. Evaluate dynamics of fluid flow and solid body interaction
5. Apply basic computational techniques in solving thermal and fluid engineering problems

Subject Content

Laminar, turbulent and compressible flows
 Thermal process of combustion
 Turbo-machinery
 Fluid-structure interactions
 Introduction to computational techniques for thermodynamics and fluid flow applications
 Special thermal and fluid engineering topics, e.g., alternative energy for indigenous Australia, buoyancy driven and multiphase flows, etc.

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
Quiz	3 x 15-minute (per Quiz)	15	N	Individual
Practical	3 x Practical reports 1000 words (per report)	30	N	Individual
Participation	9 x 2-hour tutorials	5	N	Individual
Final Exam	2-hour	50	N	Individual

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=MECH3007_22-SC1_SC_D#subjects)

Spring

Penrith (Kingswood)

Day

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3007_22-SPR_KW_D#subjects)

Parramatta - Victoria Rd

Day

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Sydney City Campus - Term 3 Sydney City

Day

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MECH3007_22-SC3_SC_D#subjects)