

# MECH 7006 ADVANCED THERMAL AND FLUID ENGINEERING

**Credit Points** 10

**Legacy Code** 301021

**Coordinator** Mariam Darestani (<https://directory.westernsydney.edu.au/search/name/Mariam Darestani/>)

**Description** This subject covers fundamental principles in the thermal and fluid engineering. While the main focus will remain on incompressible fluids, effects of compressible fluids will also be discussed. The contents of this subject include fluid mechanics, thermodynamics and heat transfer. Students will learn the engineering applications of thermal and fluid principles.

**School** Eng, Design & Built Env

**Discipline** Mechanical Engineering

**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** Postgraduate Coursework Level 7 subject

## Restrictions

Students must be enrolled in a postgraduate program

## Assumed Knowledge

Fundamental knowledge of fluid mechanics, theory of thermodynamics, knowledge of heat transfer including conduction, convection.

## Learning Outcomes

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

1. Apply fundamental knowledge of fluid kinematics and dynamics to solve problems in the fluid engineering.
2. Apply the energy equation to solve the energy and mass flow.
3. Analyse the thermodynamics process and heat transfer of a system.
4. Apply heat transfer principles to the design and evaluation of industrial device.
5. Evaluate heat engine and refrigeration cycles using the thermodynamics principles.

## Subject Content

1. Fluid statics and kinematics
2. Steady incompressible flow in pressurised pipe system
3. Forces on bodies immersed in fluid flow
4. Laws of thermodynamics
5. Energy analysis
6. Fundamental mechanisms of heat transfer

## 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	Mandatory
Report	2500-word practical report	25	N	Individual	Y
Report	2500-word written report	25	N	Individual	Y
Quiz	1-hour closed book	25	N	Individual	Y
Quiz	1-hour closed book	25	N	Individual	Y

## Prescribed Texts

- C'engel, YA, Cimbala, JM & Turner, RH 2012, Fundamentals of thermal-fluid sciences, 4th edn, McGraw-Hill Higher Education, Boston.

## Teaching Periods

### Spring (2025)

#### Parramatta City - Macquarie St

#### Hybrid

**Subject Contact** Mariam Darestani (<https://directory.westernsydney.edu.au/search/name/Mariam Darestani/>)

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=MECH7006\\_25-SPR\\_PC\\_3#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MECH7006_25-SPR_PC_3#subjects))