

# ENGR 7006 FIRE ENGINEERING 1 (FIRE DYNAMICS)

**Credit Points** 10

**Legacy Code** 300709

**Coordinator** Sameera Wijesiri Pathirana ([https://directory.westernsydney.edu.au/search/name/Sameera Wijesiri Pathirana/](https://directory.westernsydney.edu.au/search/name/Sameera+Wijesiri+Pathirana/))

**Description** This subject aims to develop a detailed knowledge of fire behaviour and dynamics in the built environment. Students will be able to understand fuels and combustion processes; the chemistry of combustion; flammability limits; ignition characteristics; and different types of flames and fire plumes. The content also covers the burning of liquids and solids; flammable vapour/air mixtures; extinction and extinguishment; flame spread mechanisms and modeling; flashover; fire resistance and fire severity; projection of flames from burning compartment openings; spread of fire from a compartment; production and measurement of smoke; and smoke movement.

**School** Eng, Design & Built Env

**Discipline** Fire Technology

**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

**Equivalent Subjects** LGYB 8308 - Fire Engineering 1 (Fire Dynamics)

## Restrictions

Students must be enrolled in a postgraduate program.

## Learning Outcomes

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

1. Explain the basic principles of the fire phenomenon including the nature of fire, heat transfer, burning of gases, liquids and solids, initiation and propagation and products of combustion
2. Identify fire hazards & causes of fires and health effects of toxic smoke
3. Determine fire loads, fire growth, ventilation factor
4. Explain flashover, fire severity and fire resistance of structural materials, suppression systems, smoke and heat control, detection, warning and how these parameters are used in the development of a fire safety engineering solution
5. Analyse a range of fire scenarios and apply fire science to interpret and develop fire safety engineering solutions

## Subject Content

Fuels and the combustion process  
Chemistry of combustion in fire  
Flammability limits  
Premixed flames  
Diffusion flames  
Flames from natural fires  
Fire plumes  
Burning of gases and vapours

Burning of liquids  
Burning of solids  
Smouldering combustion  
Flaming combustion  
Self-induced ignition  
Piloted and non-piloted ignition  
Propagation of smouldering and flaming combustion  
Growth to flashover  
Flashover  
Post-flashover fires  
Fire resistance  
Spread of fire from a compartment  
Production and measurement of heat, smoke and toxic gases  
Methods for assessment of fire behaviour

## 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
Numerical Problem Solving	Analytical, 2,000 word equivalent, individual	25	N	Individual	N
Numerical Problem Solving	Analytical, 2,000 word equivalent, individual	25	N	Individual	N
Numerical Problem Solving	Analytical, 2,000 word equivalent, individual	25	N	Individual	N
Numerical Problem Solving	Analytical, 2,000 word equivalent	25	N	Individual	N

Teaching Periods

## Autumn (2025)

**Parramatta City - Macquarie St**

**Hybrid**

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View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ENGR7006\\_25-AUT\\_PC\\_3#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR7006_25-AUT_PC_3#subjects))