

ENGR 7006 FIRE ENGINEERING 1 (FIRE DYNAMICS)

Credit Points 10

Legacy Code 300709

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Description This unit 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

Level Postgraduate Coursework Level 7 subject

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

Restrictions

Students must be enrolled in a postgraduate program.

Assumed Knowledge

Physics, chemistry, engineering mathematics.

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.

Item	Length	Percent	Threshold	Individual/ Group Task
Numerical Problem Solving	Analytical, 2,000 word equivalent, individual	25	N	Individual
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Teaching Periods

Autumn

Online

Online

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

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR7006_22-AUT_ON_O#subjects)