

ENGR 6001 BUSHFIRE DESIGN AND CLIMATE CHANGE

Credit Points 10

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

Description This subject considers the concept of 'design bushfire' and the impact of climate change upon varying weather and climate conditions in Australia and globally. The potential implications of climate change on bushfire behaviour and bushfire design are developed. Students will be introduced to the concept of "Bushfire Protection Design Guidelines" including the concepts of Bushfire Design Brief and Bushfire Design Subsystems, as well as the Bushfire Verification Method adopted by the National Construction Code. Students will be able to calculate recurrence conditions for bushfire behaviour and bushfire weather conditions using extreme values techniques. Students will compare different bushfire behaviour models and their implications for future climatic conditions in developing performance solutions for bushfire protection. The role of landscape fires and fire generated winds will also be considered in the context of planning and building for bushfire protection. The role of traditional Aboriginal burning practices and culture also forms an important aspect of this subject.

School Eng, Design & Built Env

Discipline Fire Technology

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.

Learning Outcomes

1. Explain the effects of vegetation, topography and weather patterns on bushfire occurrence and behaviour;
2. Explain the impacts of historical bushfire events on loss of life and property;
3. Prepare a bushfire design brief, bushfire design sub-systems and acceptance criteria using bushfire design guidelines;
4. Evaluate weather observations and predict fire behaviour to current and future design bushfires;
5. Apply the Bushfire Verification Method to bushfire design for planning and building;
6. Apply suitable methods of fire behaviour and View Factor models for different design conditions;
7. Analyse differences in cultural burning practices and prescribed burning techniques and potential changes to fire regimes and ecological impacts including future climate scenarios;
8. Explain the implications of international conventions and investigations upon disaster resilience and climate adaptation especially bushfire.

Subject Content

1. Introduction to climate change and implications for world and Australia's fire weather patterns
2. Property and human life losses arising from historical bushfire events and risk

3. Vegetation, slope and weather concepts and bushfire behaviour
4. A model for Australian Bushfire Design Guidelines and Performance
5. Understanding fire weather data and statistical approaches in considering climate change
6. Comparison between fire behaviour models
7. The View Factor methodology and bushfire design Using the Bushfire Verification Method for determining factors of bushfire design.
8. Short-fire runs and radiant heat barriers
9. Modelling landscape fires and fire generated winds
10. Concept of herd immunity and bushfire protection
11. Fire thresholds and ecosystem impacts, traditional burning practices and hazard reduction
12. Sendai Framework for Disaster Risk Reduction.

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
Essay	1000 words (2 x 500 words)	20	N	Individual
Case Study	1500 words	30	N	Individual
Report	1500 words	30	Y	Individual
Essay	1000 words (2 x 500 words)	20	N	Individual

Prescribed Texts

Australian Building Codes Board 2021, Bushfire Verification Method handbook, Australian Building Codes Board, <<https://ncc.abcb.gov.au/resource/handbook/bushfire-verification-method-handbook>>.

Teaching Periods

Autumn

Parramatta City - Macquarie St

Composite

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

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR6001_22-AUT_PC_C#subjects)