

# Fire Safety Program - ME 720 Structural Fire Resistance

## Course Objectives

This course is a basic course on the design and analysis of structures exposed to fire. It aims to enhance student understanding of the behavior of materials and structural systems under fire load and introduce them to the principles and rational design methodologies for fire resistance design.

Through class discussions, practical examples and case studies, students will obtain the background required to design buildings for fire resistance, gain experience with applications of fire resistance design concepts taught in the course and discover current issues related to designing for fire safety.

## Course Outline

- Time-temp. relationships for post-flashover fires
- Equivalent fire severity
- Material properties at elevated temperatures
- Temperature profiles in structural assemblies
- Fire resistance of steel, concrete & composite structures: hand methods & computer calculations
- Fire resistance of heavy timber & light timber frame structures

## Recommended References

Andrew H. Buchanan, *Structural Design for Fire Safety*, John Wiley & Sons, 2001.  
Franssen J., Kodur V., Zaharia, R., *Designing Steel Structures for Fire Safety*, pp. 162. Taylor & Francis, 2009.

## Supplemental Materials

T.T. Lie, (Ed), *Structural Fire Protection*, ASCE, Manuals and Reports on Engineering Practice No. 78, 1992.  
SFPE Handbook of Fire Protection Engineering, 3rd Ed., Quincy, MA: NFPA, 2007, Sections 1-8, 1-10, 4-8 to 4-11.



## Contact Us

For information on Fire Safety Group courses, registration, and admissions:

### Fire Safety Program

Dept. of Mechanical and Mechatronics Engineering  
University of Waterloo  
Engineering 7, Room 3336  
200 University Avenue  
Waterloo, ON, Canada  
N2L 3G1

Phone: (519) 888-4567, ext. 43625

e-mail: [firesafetyprogram@uwaterloo.ca](mailto:firesafetyprogram@uwaterloo.ca)