

Civil and Environmental Engineering
CIVE 5613 R & W
Fire Dynamics II
Winter Semester 2016

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Course Description

This course addresses the dynamics of fires in buildings. The phenomena that govern ignition, fire growth and severity, temperature and pressure development, toxicity and visibility are investigated. *Fire Dynamics II* builds on basic concepts presented in *Fire Dynamics I*. The manner by which containment modifies the fundamental fire processes introduced in *Fire Dynamics I* is highlighted. The course aims to develop a sound understanding of fire growth and fire severity in buildings. Particular emphasis is placed on the reaction of people, buildings and building components to exposure by fire. This basic background provides a foundation for beginning the process of designing a fire-safe building.

Office: 2037 Minto Centre

Office hours: Open door policy or by appointment.

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Lecture Time

- Lectures will be held Wednesday from 18:05 to 20:55 and on Video On Demand (VOD).

Lecture Room

- Southam Hall, Room 404

Website

- Lecture notes, examples, readings and assignments will be available on-line at CULearn website.

Evaluation

- Problem Sets: 60%
- Final Exam: 40%

Problem Sets

- Number 1: Distributed during Lecture 3
- Number 2: Distributed during Lecture 6
- Number 3: Distributed during Lecture 8
- Number 4: Distributed during Lecture 10

Final Exam

- Open book // calculators permitted

Recommended Books

- Dougal Drysdale, *An Introduction to Fire Dynamics*, Wiley, 2011.
- Björn Karlsson and James G. Quintiere, *Enclosure Fire Dynamics*, CRC Press, 2000.
- The SFPE Handbook of Fire Protection Engineering, 4th Ed., 2008.

Proposed Course Outline

- Introduction
- Enclosure Phenomena
- Ceiling Jets & Ceiling Flames
- Accumulation or Smoke Filling
- Vent Flows
- Chemistry of Room Fire Combustion
- Smoke and Heat Venting
- Heat Transfer in Enclosure Fires
- Flame Spread & Burning Rates
- Room-fire Dynamics

Academic Accommodation Statement

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www2.carleton.ca/equity/>

Religious obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www2.carleton.ca/equity/>

Academic Accommodations for Students with Disabilities

The **Paul Menton Centre** for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (*if applicable*) at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/>

You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www2.carleton.ca/equity/>