

# ENGG\*3430 Heat and Mass Transfer

## Winter 2009 Course Outline

**Instructor:** Maryam Jedari Eyvazi Room 207 Ext. 56875, [mjedarie@uoguelph.ca](mailto:mjedarie@uoguelph.ca)

Office hours: Monday and Wednesday 3:00 to 4:00 pm

**Teaching Assistants:** Suha Abdullah Room 306 [sabdulla@uoguelph.ca](mailto:sabdulla@uoguelph.ca)  
Ryan Brennan Room 315 [brennanr@uoguelph.ca](mailto:brennanr@uoguelph.ca)  
Joel Citulski Room 317 [jcitulsk@uoguelph.ca](mailto:jcitulsk@uoguelph.ca)

**Lectures:** 1:30 – 2:20pm Monday, Wednesday , Friday – MCLN 102

**Tutorials:**

Section 101:	Monday	10:30am – 11:20am – ROZH 107
Section 102:	Wednesday	10:30 – 11:20am – MACK 236
Section 103:	Wednesday	2:30pm – 3:20pm – ROZH 109
Section 104:	Thursday	2:30pm – 3:20pm – MACK 236
Section 105:	Friday	2:30 pm – 3:20pm – ROZH 108

### COURSE DESCRIPTION

This course is to introduce the basic principles of heat and mass transfer with emphasis on their analysis and applications to practical engineering problems. Students who successfully complete this course will be able to

- Identify and analysis thermal processes involving heat conduction, convection and radiation and mass transfer by molecular diffusion.
- Select and apply the appropriate correlation for transport phenomenon for different process and systems that involves heat and mass transfer.
- Integrate fundamental principles of heat and mass transfer with quantitative analysis to solve engineering problems.

### TOPICS

#### Heat transfer and Heat transfer modes:

- *Conduction*: steady state and transient heat transfer and temperature distribution in various solid geometries, thermal resistance and circuits, heat transfer from extended surfaces;
- *Convection* : concept of boundary layers, convection coefficient for different flow geometry, forced and free convections;
- *Thermal radiation*: radiation heat transfer: the means of generation, the nature of radiation, and the manner of interactions with surfaces, radiation exchange between surfaces;

- *Heat exchangers.*

Mass transfer by diffusion:

- Equations and boundary conditions, mass diffusion in stationary and non-stationary media with or without chemical reactions.

*Prerequisites:* ENGG\*2230 (Fluid Mechanics), ENGG\*3260 (Thermodynamics), MATH\*2270 (Applied Differential Equations).

**Course Web Site:** Through University of Guelph course link (Web CT) webpage.

**Text book:** Fundamentals of Heat and Mass Transfer, 6th ed.,  
Incropera and DeWitt, Wiley (2002)  
<http://ca.he.wiley.com/WileyCDA>

**Grades:** The course grades will be based on 6 assignments, two quizzes, a midterm test and a final exam using the following weighting scheme:

**Assignments** 10%  
**Quizzes** 20%  
**Midterm Test** 30%  
**Final Exam** 40%

## ASSIGNMENTS

Assignments primarily consisting of textbook problems relating to that week's lecture topics will be posted to the course website at the start of the week. The assignments will be completed on an individual basis and handed in biweekly that would be on Mondays at 4 pm sharp and must be dropped into the assignment box. Assignments will be graded for completeness and one question picked at random will be graded for correctness.

## IMPORTANT DATES

Lectures begin	Monday, January 5
Lectures end	Friday, April 3
Reading Break	Monday – Friday, February 16 – 20
Quiz 1	Monday, February 2, 1:30-2:30 pm
Midterm test	TBA
Quiz 2	Monday, March 16, 1:30 -2:30pm
Final exam	Wednesday, April 13, 8:30-10:30 am