Applied Science 150 - Engineering Case Studies

2012/13 – Term 2

Introduction

The practice of engineering involves applying scientific and technical knowledge, common sense, and experience to solving problems of practical significance for people. During this course, you will learn about engineering practice by studying specific engineering projects in lectures and laboratories, and by participating in 4 meta-skills workshops designed to enhance your professional skills.

Objectives

By the end of this course, you should be able to:

- Begin integrating your knowledge of the core competencies within engineering, including an understanding of societal context, ethics, communications, mathematics, physics, chemistry, and economics;
- Model simple engineering problems in order to address key issues of engineering projects;
- Describe specific examples of engineering design; and
- List a range of engineering challenges and opportunities available across the engineering disciplines.

Course Description

The course is divided into four distinct three-week case studies. Each case consists of a series of lectures and 5 associated laboratories. You will also attend 4 metaskills workshops. These workshops will be held during your laboratory time.

Case Studies

Each case is based on the expertise and experience of a different faculty member. The faculty member will give you lectures on the case, and ask you to work on associated assignments during your laboratories.

Case 1: Not just technical skills - Things I wish I knew when I was a student
2 Jan – 21 Jan
(Nobo Yonemitsu from Civil Engineering; email: noboru@civil.ubc.ca)

Case 2: Advanced Materials for Commercial Aircraft Structures 25 Jan - 15 Feb
(Anoush Poursartip from Materials Engineering Forward 113; email: anoush.poursartip@ubc.ca)

Case 3: Mining and the Environment 25 Feb - 13 March
(John A. Meech from Mining Engineering Forward; email: jameech@dccnet.com)

Case 4: Chemical Reaction Car 15 March Jan – 5 April
(Madjid Mohseni from Chemical and Biological Engineering; email: mmohseni@chbe.ubc.ca)

Laboratories

Your laboratory is lead by a faculty member. A teaching assistant who is a graduate student will help the laboratory leader coordinate the laboratory activities and will help you work on the laboratory assignments. The work in the laboratories will vary from case to case. Sometimes you will be asked to work with other students. At other times, you will be asked to work independently.

Please note that ATTENDANCE AT LABORATORIES IS MANDATORY.

Workshops

Four of your laboratory sessions will take the form of metaskills workshops. These workshops will enhance your non-technical skills--skills that will play a highly significant role in your professional development. The workshops have been designed by Dr. Carla Paterson and are facilitated by different faculty members.

Workshop 1: Teamwork I

Workshop 2: Teamwork II

Workshop 3: Communication

Workshop 4: Creativity

Marks Distribution

Your final grade for this course will be based on your assignment marks, your workshop performance, and on the mark you achieve on each of the end-of-case quizzes.
(Note that one mark in this course will have as much effect on your final grade as 1% for a 3 credit course.)

	Grades per Case	Total Grades
Assignments	20	80
Quiz	25	100
Metaskills Workshop	1	4
Failure Report		16
Total		200

If you are unable to submit a piece of homework or project in a timely manner or are unable to participate in any quiz due to illness or other reason, you must contact your laboratory leader to make alternate arrangements.

Scheduling

You are registered in one of the two lecture sections that run each term. You are also registered in one of the 6 laboratory sections that run each term.

Lecture Schedule

The lecture sections start on Wednesday, January 2, 2013 (introduction to APSC150). Thereafter, the order in which you receive the 4 cases is given in the following table.

Table 1: Lecture Schedule

2 Jan – 21 Jan	25 Jan – 15 Feb	25 Feb – 13 Mar	15 Mar – 5 Apr
Case 1 (and introduction to APSC150)	Case 2	Case 3	Case 4

Table 2: Lecture hours

APSC150 - Section 201	Mon	Wed	Fri	15:00	-	16:00	CHBE 101
APSC150 - Section 202	Mon	Wed	Fri	8:00	-	9:00	FSC 1005

Laboratory Schedule

You have been assigned to one laboratory group. Information on the laboratory days, times and rooms is included in the following table.

2. Laboratories

L2A	Tue	Fri	8:00	-	10:00	CEME 2206
L2B	Mon	Wed	9:00	-	11:00	CEME 2206
L2C	Wed	Fri	11:00	-	13:00	CEME 2206
L2D	Tue	Thu	10:00	-	12:00	CEME 2206
L2E	Tue	Thu	14:00	-	16:00	CEME 2206
L2F	Mon	Fri	14:00	-	16:00	CEME 2206
L2T	Mon	Fri	16:00	-	18:00	CEME 2206

Instructors

Florence Luo (ciluo@interchange.ubc.ca)
Suzan Nesbit (nesbit@interchange.ubc.ca)
Maria E. Holuszko (meh@interchange.ubc.ca)
Hamid Azizi-Alizamini (hazizi@mail.ubc.ca)

- Run laboratories
- Coordinate with TAs and mark assignments
- Enter marks in VISTA
- Invigilate Quizzes (delegate on TA to invigilate the alternative times)
- Mark quizzes
- Mark failure reports (this task is divided amongst the instructors)

3. Workshops

Four workshops given by Florence Luo (ciluo@interchange.ubc.ca) during Laboratory times. See the schedule for dates.

- Run workshops
- Take attendance and pass it over to TAs for VISTA entry

Lecture and Laboratory Schedule

L – lectures

Week of	Monday	Tuesday	Wednesday	Thursday	Friday
Jan 2	Holiday	Holiday	L 1.1 B: W1	 D, E: W1	L.1.2 A, C, T, F: W1
7	L1.3 B, F, T: 1.1	 A, D, E: 1.1	L 1.4 B: 1.2 C: 1.1	 D, E: 1.2	L.1.5 A, C, F, T: 1.2
14	L1.6 B, F, T: 1.3	 A, D, E: 1.3	L 1.7 B: 1.4 C: 1.3	 D, E: 1.4	L.1.8 A, C, F, T: 1.4
21	L1.9 B, F,T:1.5	 A, D, E: 1.5	L library B: W2 C: 1.5	 D, E: W2	L.2.1 A, C, F, T: W2
Jan 28	L2.2 B, F, T: 2.1	 A, D, E: 2.1	L 2.3 B: 2.2 C: 2.1	 D, E: 2.2	L.2.4 A, C, F, T: 2.2
Feb 4	L2.5 B, F, T: 2.3	 A, D, E: 2.3	L 2.6 B: 2.4 C: 2.3	 D, E: 2.4	L.2.7 A, C, F, T: 2.4
11	NO CLASSES FAMILY DAY	 A,D,E:W3,4	L 2.8 B, C: W3,4	 D, E: 2.5	L 2.9 A, C: 2.5 F, T: W3,4
18	Reading Break				
25	L3.1 B, F, T: 2.5	 A, D, E: 3.1	L 3.2 B,C: 3.1	 D, E: 3.2	L.3.3 A, C:3.2 F, T: 3.1
March 4	L3.4 B, F, T: 3.2	 A, D, E: 3.3	L 3.5 B: 3.3 C: 3.3	 D, E: 3.4	L.3.6 A, C: 3.4 F, T: 3.3

11	L3.7 B, F, T: 3.4	 A, D, E: 3.5	L 3.8 B,C: 3.5		L.4.1 F, T: 3.5
18	L4.2 B, F, T: 4.1	A, D, E: 4.1	L 4.3 B: 4.2 C: 4.1	D, E: 4.2	L 4.4 A, C, F, T: 4.2
25	L4.5 B, F, T: 4.3	 A, D, E: 4.3	L 4.6 C: 4.3		 NO CLASSES GOOD FRIDAY
April 1	 NO CLASSES ESTER MONDAY	 A: 4.4 D, E: 4.4	L 4.7 B, C: 4.4		L 4.8 F, T: 4.4

End-of-Case Quizzes

There will be a quiz at the end of each case. The first three quizzes will be held outside of regular laboratory hours in the evenings. The dates for the quizzes are given in the following table. The last quiz will be held during the period for final exams.

Quiz Number	Date/Location
Case 1	29 January 2013
Case 2	26 February 2013
Case 3	19 March 2013
Case 4	During final exam period

Times are 6.30-8.30 pm, and room numbers will be announced closer to the times of the quizzes.
Note: The final quiz for this course will be equivalent to any other end-of-case quiz.

Instructors

Each case study will be led by a professor whose expertise and experience is related to the case they will be presenting.

Written Submissions

You are reminded that written submissions required as part of some laboratory assignments need to be your own work, with other people's work appropriately cited. Plagiarism, the passing off of another's work as one's own, is not acceptable and is subject to severe penalties. See the section 3.1.1 of the ACADEMIC MISCONDUCT section of the UBC calendar.

For more information on plagiarism, please consult UBC library's webpage devoted to the subject.

Textbook (optional)

Fundamental Competencies: Preparing the 21st Century Engineer, Dunwoody, Cramond, Nesbit, Paterson and Teslenko, Oxford University Press, 2006.

Tips for Doing Well in this Course

1. Do all the laboratory assignments. (Make a copy of each assignment before submitting it.)
2. Attend all labs/workshops to get to know many people in your labs.
3. The mark you achieve in this course is highly dependent on your performance during the quizzes. Here are some tips for writing quizzes and exams:
    - Have a look at the examination room before the exam. Decide where you will sit during the exam.
    - Bring ear plugs to the examination if you are easily distracted during exams.
    - Once you are invited to start the examination, READ THROUGH EACH QUESTION before you start writing.
    - If possible, determine how many marks are associated with each exam question and devise a time schedule for the exam period. KEEPING TO THIS SCHEDULE will ensure that you attempt each question in the examination.
    - Start the exam by doing the questions you feel most comfortable with. Leave the more difficult questions to the end of the exam time period.