Engineering & Design II - Course Outline
ENGG*2100 - Fall 2007

Instructor: Warren Stiver, Ph.D., P.Eng.
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wstiver@uoguelph.ca
www.soe.uoguelph.ca/webfiles/wstiver (course website - sharing public domain information)
folio.soe.uoguelph.ca (Guelph engineering portfolio system)
WebCT site too (communication & sharing non-public domain information)
Office Hours: any time I am in my office (my base schedule is posted on my office door and on my website)
10:50 to 11:15 on Tues/Thurs in LA204

Teaching Assistants: (No office hours)
Angela Catford
Karen Finney
Jigar Shah

Support:
Ken Graham (Shop)
John Phillips (NX4)

Class times: Course Section Code: 10YZ (Y Lab; Z tutorial)

LECTURES

ALL	Tu, Th	10:00 - 10:50

LAB Sections (You MUST attend your assigned section only)

Y=1 ... Wednesday	2:30-5:20
Y=2 ... Friday	2:30-5:20
Y=3 ... Tuesday	2:30-5:20

Labs will use all of the following rooms
THRN 1135, SHOP (THRN 1170), THRN 1103
Lab Attendance is expected.

TUTORIAL Sections (You MUST attend your assigned section only)

Z=1 ... Thursday	11:30 - 12:20 CRSC 116
Z=2 ... Tuesday	11:30 - 12:20 CRSC 116
Z=3 ... Tuesday	1:30-2:20 THRN 1103

Attendance is required Week 1 PLUS two additional weeks as scheduled. Schedule will be posted via WebCT.

Textbook & Reading Material:

No required textbook.

ENGG*1100 textbook has a number of valuable and relevant chapters.

There are a large number of books in the library that are relevant. Some website links are identified on the course website. Examples...

Cross N. (2000) *Engineering Design Methods: strategies for product design,* (TA174.C76)

Dieter G.E. (1983) *Engineering Design: A Materials and Processing Approach*, 1st Edition, McGraw Hill.

Hunter T.A. (1992) *Engineering Design for Safety*, McGraw-Hill, New York, 298p. (TA166.H86)

Some documents will be provided via WebCT. These compliment the lecture material and you are responsible for the content within them.

Prerequisites:

ENGG*1100, ENGG*1210, ENGG*1500, MATH*1200, PHYS*1130

(It is expected that students will have completed the majority of the first year courses and be taking the majority of the semester 3 courses for their engineering program)

Undergraduate Calendar Description:

*ENGG*2100 Engineering & Design II. F(2-4)*. [0.75]

Progression in engineering design skills with particulare emphasis on computer usage in design, oral communication of solutions and team skills. Computer usage in design will include advanced CAD/CAM/CAE tools, structured programming and database management software. An introduction to safety in engineering practice and design. An introduction to the concept of sustainable development.

Credit Weighting:

0.75 (This means an *average* student requires about 15 hours per week to get a 'B' grade. This 15 hours includes the 6 hours of scheduled class time.)

Evaluation:

Team Design (1)	45% (including oral evaluation component)
CAE Task (1)	25% (including in lab evaluation component)
Presentation (2)	10%
Final Exam (1)	20% (December 6th, 2:30 -4:30 pm)

Note: A failing grade on the Team Design portion OR a failing grade on any two of the remaining three items will mean that you have failed the course. The assigned grade will be based on the failed items only.

Grading philosophy to be used recognizes that design has a significant artistic component and is not a right or wrong situation. Thus, we will start with a perspective that your work is assumed to be a "B" until there is evidence within that work that is impressive or aspects that are disappointing. Impressive and disappointing components are integrated to leave a final assessment. Letter grades are used to reflect that the process is not ±2% accurate and that design could never be assessed with fine resolution.

Letter grade translation:

A+	*Really Impressive*	*100*
A	*Impressive*	*90*
A-		*85*
B+		*80*
B	*Expected*	*75*
B-		*72*
C+		*68*
C	*Satisfactory*	*65*
C-		*62*
D+		*58*
D	*Disappointing, serious flaws*	*55*
F	*Inadequate*	*35*
X	*no submission or wholly inadequate*	*0*

Academic Conduct Expectations and Academic Misconduct:

The team design project will have multiple written submissions. All team members must sign the cover sheet for the report. This cover sheet must also have the following statement.

> *In signing this cover page, I certify that I have been an active member of the team and provided approximately equal contribution to the work. I understand that taking credit for work that is not my own is a form of academic misconduct and will be treated as such.* (see UofG Calendar, 2002-2003, p30).

Respect for ownership of Intellectual Property (e.g. copyright, patents, trade marks, music, software) is important. Work that has been created or prepared with unlicensed or illegal software will not be knowingly accepted for submission within the course (e.g. a grade of zero will be assigned).

Engineering Portfolio

(folio.soe.uoguelph.ca; your account is your university login id and your initial password is your student number)

We are continuing to develop the Guelph Engineering Portfolio system. The goal of the portfolio is to provide a focal point Guelph students to showcase their work. It will be a place where your work will stored. Once it is fully developed, you will have the option to permit prospective employers to see your work - your presentations, reports, spreadsheets, drawings, computer programs, engineering calculations etc. We will have the option to showcase to accreditation bodies and others the calibre of your work. It will take us some time to build all of these features and bring all of your courses online.

The Guelph Engineering Portfolio system has been developed by Ben Millen (ES&C - 2002), Ryan Connors (4th year ES&C), Katherine Sorensen, Jerry An and myself. Financial support for its development is from NSERC via my NSERC Chair in Environmental Design Engineering. As a system under development, there remains a real risk of a crash or two in the system thus for all of your submissions will use both formats (conventional paper and electronic via the portfolio).

Team Design

You will each participate in one design-build-test project. You will be assigned to teams of approximately 5. You will advance your design, hands-on, database, team and communication skills.

CAE Design Task

A Computer-Aided-Engineering project will be completed (using NX4 software). There are both individual and team elements to this task.

Presentations

Tutorials

You will each individually provide two oral presentations during your tutorial sessions. Effective oral presentation skills and comfort come from a combination of practice and feedback. It also comes from observing and considering what does and doesn't work for others.

You are required to attend your tutorial session in Week #1 plus the two other weeks in which you are scheduled to present. Week 1 will be used to provide additional detail regarding the format and expectations, provide you with the evaluation criteria that will be used, and provide you with a range of presentation tips (Do's and Don't's). Weeks 2-6 are for oral presentations without any visual aids. Weeks 7-12 will be your scheduled presentation opportunity with visual aids (Powerpoint). Powerpoint assistance will be provided as one of the computer labs.

The schedule and topic for your two individual presentations will be posted through WebCT. You are RESPONSIBLE for checking the schedule and attending the appropriate week. You are **required** to provide feedback to your

colleagues who are presenting during your presentation weeks. You are free to attend other tutorials but not required to do so.

Design-Build

You will be providing two team based presentations within your Design-Build project.

CAE Task

You will be presenting your 3D drawing and as a team your assembly drawing.

Portfolio

Your individual and team presentations will be videotaped and added to your portfolio.

Lectures:

The lecture component of the course is to assist in your design skill development. The lectures will not explicitly address the technical requirements of your Design Project or your Design Tasks. The Final Exam will be used to assess your understanding of this lecture material.

Lecture outline: approximate # of hours

Introduction 1

Team Skills 5

Creativity 4

Safety 6

Computers in Design 2

Sustainable Development 5

Course Review 1

Comments:

All students are encouraged to submit signed written comments (positive or negative) to the Director of the School of Engineering on any aspect of this course.

Safety:

Many laboratory sessions will be held in the School's machine shop. The following safety principles apply to all sessions and to all students:

- ✓ Ken Graham has full authority for all aspects of our time in the shop
- ✓ There will be a maximum of 20 students in the shop at any point in time and this number can only be supported when both Ken and a GTA are present
  - ✓ You will NOT be able to attend any lab session other than the one assigned to your lab section of the course (this includes Week 11 in which time pressures may increase your desire to attend additional times)
- ✓ You will be required to show respect for Ken, your GTA and the shop's equipment
- ✓ You will be required to dress appropriately
  - ✓ No open toed shoes
  - ✓ No lose clothing
- ✓ Safety glasses are to be worn
- ✓ Shop coats are to be worn
- ✓ If you do not know how to use shop equipment - ASK.
- ✓ THINK first.
- ✓ Additional rules will be posted in the shop or expressed by Ken.

Failure to safely work in the shop may lead to lost shop privileges. This is likely to have academic consequences.

Lab Time Layout - ENGG*2100 - Fall 2007

each lab section will be split in two halves.

Week	Design-Build Project Shop (Rm 1170) & Design Lab (Rm 1103) 2:30 - 3:55 (except "B" groups)	CAE Task Computer Lab (Rm 1135) 3:55 - 5:20	"Due" at Beginning of the Lab unless otherwise noted	
			Design Build	CAE
1 Sept 10-14	CAE reverse eng'g (Shop) DB Team forming	CAE Intro Skills	Team Data	
2 Sept 17-21	CAE reverse eng'g (Shop) DB Questions	CAE Base Skills		"Quiz"
3 Sept 24-28	CAE part assignment / material ID (Shop) Learning Styles, Idea Feedback (Design Lab)	2D Drawings		
4 Oct 1-5	Design - Coaching on Analysis (Design Lab)	Assembly	Submission #1 Ideas & Feasible Three	"Quiz"
5 Oct 8-12	Design - Team reflection	3D support		2D Dwgs
6 Oct 15-19	Design - Coaching for Presentation #1 (Design Lab)	Powerpoint, Database		"Quiz"
7 Oct 22-26	Presentation #1 (Design Lab)	CAE - FEA for ENGG*2120	Submission #2 & Presentation #1 - Proposed Solution	
8 Oct 29 - Nov 2	Shop & Design Lab	3D support	Be prepared to use Shop time	
9 Nov 5-9	Shop & Design Lab	3D presentation & submission		3D Submission & Evaluation
10 Nov 12-16	Shop & Design Lab	Assembly & Design-Build Dwgs Support		
11 Nov 19-23	Shop & Design Lab	CAE Assembly presentation & submission		CAE Assembly Submission, Presentation & Evaluation
12 Nov 26-30	Design Project Presentations & Evaluation Shop & Design Lab		Final Report Submission & Dwg Evaluations Presentation #2	

For Tuesday & Wednesday lab sections we have both an "A" and a "B" group. The "B" group will start in the Computer lab each week and switch to the Design space at the half way point.