

Engineering & Design II (ENGG*2100)

Fall 2011 Course Outline

Instructor: Shohel Mahmud, Ph.D., P.Eng.
Assistant Professor
Room: 1410, Thornbrough Bldg
Tel: 519 824-4120 ext: 54058
Email: smahmud@uoguelph.ca

Teaching Assistants: (No office hours)
Thomas Hummel (thummel@uoguelph.ca)
Matthew Renaud (mrenaud@uoguelph.ca)
Sara Altimimi (saltimim@uoguelph.ca)
Daniel Roth (droth01@uoguelph.ca)
Murray Lyons (mlyons@uoguelph.ca)

Teaching Support:
Ken Graham (Shop)

Prerequisites:
ENGG*1100 plus 4.0 credits
(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 particular emphasis on computer usage in design, on 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 per week.

Learning Objectives, Accreditation Units and Graduate Attributes

The University of Guelph has a series of Learning Objectives (UofG Academic Calendar). The Province of Ontario has established University Degree Level Expectations (UDLEs). The Canadian Engineering Accreditation Board (CEAB) assesses engineering programs using Accreditation Units and has recently introduced twelve graduate attributes has outcomes assessment measures. ENGG*2100 delivers 68 AU's (of the total 1950 required by CEAB) of which 75% are for design and 25% for complementary studies (mostly communication). In terms of twelve graduate attributes, ENGG*2100 directly supports Design (#4), Use of Engineering Tools (#5), Individual and Team Work (#6), Communication skills (#7), Professionalism (#8), Impact of Engineering on Society and the Environment (#9), and Life-long learning (#12).

Class times: Course Section Code: 010YZ (Y Lab; Z tutorial)

LECTURES

ALL (in ALEX100) Tuesday and Thursday 8:30am – 9:20am

LAB

You MUST attend your assigned section only

Lab Attendance is expected for all weeks

All of the following rooms THRN 1004, SHOP (THRN 1025), THRN 1002

Sections

Y=1	Tuesday	2:30pm - 5:20pm
Y=2	Thursday	2:30pm - 5:20pm
Y=3	Monday	11:30am - 2:20pm
Y=4	Wednesday	11:30am - 2:20pm
Y=5	Friday	11:30am - 2:20pm

TUTORIAL

You MUST attend your assigned section only

Attendance is required Week 2 PLUS two additional weeks as scheduled. Schedule will be posted via Design2Learn system.

Sections

Z=1	Wednesday	9:30am - 10:20am	THRN 1002
Z=2	Friday	9:30am - 10:20am	THRN 1002
Z=3	Wednesday	11:30am - 12:20pm	THRN 1006
Z=4	Friday	11:30am - 12:20pm	THRN 1006
Z=5	Wednesday	3:30pm - 4:20pm	THRN 1002

Example: If your section number is 01042, your Lab is on Wednesday (11:30am to 2:20pm) and Tutorial is on Friday (11:30am to 12:20pm)

Textbook & Reading Material:

No required textbook.

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)

Additional Course Materials:

D2L

Posting course outline, team assignment, presentation schedules, project descriptions, lecture slides, reading material, old exams etc.

Evaluation:

Team Design Projects (2)	50% (including oral evaluation component)
CAE Project (1)	20% (including in lab evaluation component)
Presentation (2)	10%
Final Exam (1)	20% (Tuesday, Dec 6 th , 2:30pm to 4:30pm)

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:

Grading philosophy 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 $\pm 2\%$ accurate and that design could never be assessed with fine resolution.

Letter grade translation:

A+	<i>Really Impressive</i>	100
A	<i>Impressive</i>	90
A-		82
B+		78
B	<i>Expected</i>	75
B-		72
C+		68
C	<i>Satisfactory</i>	65
C-		62
D+		58
D	<i>Disappointing, serious flaws</i>	55
D-		52
F	<i>Inadequate</i>	35
X	<i>no submission or wholly inadequate</i>	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).

Team Design Projects

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

CAE Design Project

A Computer-Aided-Engineering project will be completed. There are both individual and team elements within this project.

Presentations

In 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 section 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, to provide you with the evaluation criteria that will be used, and to 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 assistance will be provided during one of the computer labs. The schedule and topic for your two individual presentations will be posted through D2L. 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 you are not required to do so.

In Design-Build

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

In CAE Task

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

Final Exam:

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. The Final Exam will be closed book and no individual exercise.

<u>Tentative Lecture outline:</u>	<u>approximate # of hours</u>
Introduction	1
Team Skills	4
Creativity	4
Safety	7
Sustainable Development	7
Course Review	1

Engineering Portfolio

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

We are continuing to develop the Guelph Engineering Portfolio system. The goal of the portfolio is to provide a focal point for Guelph students to showcase their work. It will be a place where your work will be 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 Prof. W. Stiver. Financial support for its development is from NSERC via Prof. W. Stiver's NSERC Chair in Environmental Design Engineering.

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 10 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 loose 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.