University of Guelph
School of Engineering
Engineering and Design I, ENGG*1100
Fall, 2007

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Text: "Introduction to Professional Engineering in Canada", G. Andrews, J. Dwight Aplevich, R. Fraser and H. Ratz, Prentice Hall, 2nd edition, 2006.

Schedule:

Lectures:	Tue. 8:30-9:20		MCLN 102
	Thu. 8:30-9:20		MCLN 102
Problem Labs (SEM)	Mon.	9:30 -11:20	ENG1103
	Wed.	9:30 -11:20	ENG1103
	Wed.	11:30-13:20	ENG1103
	Fri.	9:30-11:20	ENG1103
Graphic Labs (LAB)	Wed.	9:30 -11:20	ENG2313
	Thu.	14:00-15:50	ENG2313
	Fri.	9:30-11:20	ENG2313

Course Description:

Engineering and design I course is intended to provide a firm methodological basis for engineering design that will be broadly applicable in all areas of engineering. Students integrate basic science, mathematics, and complementary studies to develop and communicate engineering solutions to specific needs using graphical, oral, and written means. Application of computer-aided drafting, spreadsheets, and other tools to simple engineering design problems. The practice of professional engineering and the role of ethics in engineering.

This is a course designed to introduce new students to engineering and the process of engineering design and analysis. Introduced are some of the key tools used in engineering including the use of spreadsheets (Excel), word processors (Word), and graphics (AutoCAD LT 2007). Emphasis is on developing skills with elementary tools which will be used throughout the engineering program, the

Outline07_v1

importance of communication through drawings, presentations and writing and the key steps in solving most engineering problems.

Course Learning Objectives:
- develop the engineering skills necessary to address technical problems.
- develop a systematic methodology for design
- develop good communication skills.
- develop analytical/design skills.
- develop creativity, problem solving, and decision-making techniques.
- develop teamwork and leadership skills.
- become familiar with the technical drawing and graphics language as means of expressing and communicating an engineering design.

Grade Evaluation:
Assignments	20%	
Term Project	20%	
Midterm Exam	20%	
Final Exam	40%	(10% of the final graphics exam + 90% of the final problems exam)

Important Notes:
- Assignments are due on the day of your scheduled problem/graphic lab session, **one week after the session at 10:00am**. These are to be submitted in the appropriate box in the foyer of the engineering building. **Late assignments will not be marked.**

- The lowest assignment from each of the problems and graphics assignments will be dropped from the final evaluation.

- **P9** assignment must be submitted by **all sections on Tuesday, November 26, 2007 (10:00am).**

- Individual and original assignments are to be submitted by each student unless otherwise indicated.

- Students are expected to attend their assigned graphics and problems lab sessions. The TAs will give **the final and updated instructions** during the lab sessions.

- Unless otherwise noted, all assignments are to be submitted on suitable engineering paper.

- **The midterm test is scheduled for Tuesday, October 23, 2007, time: 8:30am, location: (TBA).**

- **The final exam (problems) is scheduled for December 3rd, 2007 (8:30-10:30pm).** Note that the final exam will include a **graphics** lab portion during the **week of (November 19, 2007) of classes**, **at the time of the Graphics Lab sessions.**

- Communications regarding this course will frequently involve the course web page and e-mail. Students are responsible for checking the course website and the university email account for all instructions and announcements. This must be done at least once every week.

- October 8 is the thanksgiving holiday; therefore, Monday's Groups must attend the lab with other sections during the week of October 8. Submission of the P4 lab assignment (Monday's Group) will be on **October 15, 10:00am**.

Term Project:

Each student is required to complete a term project as part of this course. The project will involve the preliminary proposal, final proposal, final report and presentation on a subject detailed in the problem assignments. Projects are to be done in groups of from 4 or 5 from the same problem lab section, either selected by the students or assigned by the instructor. Students wishing to create their own groups must do so by **September 20th** by submitting the names of their groups to the instructor. Those students not yet in groups at that time will be assigned to groups by the course instructor and a full list of groups published on **September 27th**.

The project will comprise problem assignments P3, P6, a project report and a presentation. Grading for the projects will comprise all of these but P3, which will be graded separately. Project report deadline is **November 23th, 2007 (16:00).** The breakdown of the grading for the projects will be:

P6	10%
Presentation	10%
Performance	20%
Final Report	60%

The **final project mark** for each member of a design group depends on **his/her performance** within the group.

University Policy on Academic Misconduct:

Academic misconduct, such as plagiarism, is a serious offence at the University of Guelph. Please consult the Undergraduate Calendar 2007-2008 and School of Engineering programs guide, for offences, penalties and procedures relating to academic misconduct.
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Disclaimer:

The instructor reserves the right to change any or all of the above in the event of appropriate circumstances, subject to University of Guelph Academic Regulations.

Problems Solving Section (Schedule of Topics)

Week	Lecture Material (every Tuesday)	Seminar Lab Assignment
Sept. 10	**Engineering, Units, Measurement& Errors** **-** the role of an engineer, engineering calcs., measurements, dimensions basic units - uncertainty, sig. figures, estimating errors	**No lab assigned**
Sept. 17	**The Engineering Design Process** - engineering design; design process - problem definition, constraints & criteria - the design loop	**P1-Engineering Approximations**
Sept. 24	**Preliminary Ideas & Design Teams** - team organization & dynamics **-** design notes, information gathering - information gathering, brainstorming	**P2-DesignProcess: Problem Definition**
Oct. 1st	**Problem Analysis & Recourses Planning** - analysis of design process **-** time & resource planning & scheduling **-** CPM &Gantt Charts	**P3-DesignProcess: Preliminary Design Ideas**
Oct. 8	**Decision-Making** **-** evaluating alternatives **-** basic decision-making method **-** decision matrix; criterion functions	**P4-Project Planning & Scheduling**
Oct. 15	**Design Implementation & Reporting** - design reports; final presentation, demonstration and report	**P5 - Information Sources Exercise**
Oct. 22	**Mid-Term Examination**	**P6-Term Project: Preliminary Design**
Oct. 29	**Economic Analysis** - cost considerations converting between types of cost **-** equivalent uniform annual cost - Cash flow diagrams	**No lab assigned**
Nov. 5	**Professional Practice & Code of Ethics** -engineering is a profession**,** PEO membership & code of ethics - engineering seal, iron ring	**P7 - Engineering Design and Economic Analysis**
Nov. 12	**Technical Presentations** **-** preparation of material - delivery, visual aids, formal meetings	**P8 - Engineering Ethics**
Nov. 19	**Contemporary Engineering** - special lecture	**P9 - Critical Evaluations**
Nov. 26	**Course Review & Evaluation**	**Projects Presentations**

Graphics Section (Schedule of Topics)

Week	Lecture Material (every Thursday)	Graphics Lab Assignment
Sept. 10	**Intro. To Engineering Graphics** - importance of engineering graphics - tools; pencil & paper, CAD - visualization, scale, angles of projection - type of CAD modeling	**G1-Introduction to SOE Computing Facilities.**
Sept. 17	**Graphics and Communications Basics** Engineering drawing layout and elements engineering office communications design notes and calculations	**G2-Hand Sketching**
Sept. 24	**Communication by Graphs** - effectiveness for communicating ideas - types, key elements - spreadsheet as a design tool	**G3-Intro to AutoCAD LT 2007**
Oct. 1st	**Views & Projections** - multi-view drawings, 3-view drawings - orthographic projection, types	**No lab assigned**
Oct. 8	**Engineering Communications** - email, memos & letters design notes, - technical letters; technical reports - letter of transmittal	**G4-AutoCad LT 2007 Basic**
Oct. 15	**Advanced Spreadsheets** - some concepts, functions, formulas - modeling, calculation - dimensioning, types of dimensioning	**G5-Orthographic Projection**
Oct. 22	**Sectional Views** - definition, types - sections as views	**G6-Graphs by Excel**
Oct. 29	**Auxiliary Views** - definition, types of auxiliary views - drawing an auxiliary view	**No lab assigned**
Nov. 5	**Advanced Graphics** - 3D projection, pictorial drawing - isometric and oblique projection	**G7–Sectional & Auxiliary views**
Nov. 12	**Graphics Summary** - putting it all together concept - engineering final drawings - working and CAD drawings	**G8-Detailed Drawing & Isometric projection**
Nov. 19	**Professional Practice** - special lecture	**Graphics Lab Final Exam**
Nov. 26	**Course Review and Makeup lecture**	**No lab assigned**