University of Guelph School of Engineering Engineering and Design I, ENGG*1100 Fall 2005

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<u>Text:</u>	"Introduction to Profes Aplevich, R. Fraser and	ssional E H. Ratz,	Engineer , Prentic	ring in Canad e Hall	la", G. Andrews, J. Dwight	
<u>Schedule:</u>	Lectures:	T T	Tue. 8:30-9:20 Thu. 8:30-9:20		MACN 105 MACN 105	
	Problem Semir	nar M M V F	Aon. Aon. Ved. Fri.	9:30 -11:20 11:30-13:20 9:30 -11:20 9:30-11:20	THRN1103 THRN1103 THRN1103 THRN1103	
	Graphic Labs	N V V T	Aon. Ved. Ved. Thu.	9:30-11:20 9:30 -11:20 11:30-13:20 14:30-16:20	THRN2313 THRN2313 THRN2313 THRN2313	

Course Description:

Engineering and Design I is intended to provide a firm 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 is stressed. The practice of professional engineering and the role of ethics in engineering is also covered.

This is a course designed to introduce 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 2000). Emphasis is on developing skills with elementary tools which will be used throughout the engineering program and beyond, the 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	10%	
Midterm Exam	20%	
Final Exam	50%	(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.
- 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 term test is scheduled for Thursday, October 20, 2005, time: 8:30 am.
- The final exam is scheduled for December 16, 2005 (2:30-4:30). Note that the final exam will include a graphics lab portion during the week of November 28, 2005, at the time of the Graphics Lab sessions.
- Communications regarding this course will frequently involve the use of WebCT and e-mail. Students are responsible for checking the WebCT location and your university email account for all instructions and announcements. It is expected that this will be done at least once every week.
- October 10th is the thanksgiving holiday; therefore, Monday's Groups must attend the lab with other sections during the week of October 10th.

<u>Term Project</u>

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 26th** 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 30th**.

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 25th**, **2005** (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 2003-2004 and School of Engineering programs guide, for offences, penalties and procedures relating to academic misconduct. http://www.uoguelph.ca/undergrad_calendar/08-amisconduct.shtml

Week	Lecture Material (every Tuesday)	Seminar Lab Assignment	
Sept. 12	Engineering, Units, Measurement&	No lab assigned	
	<u>Errors</u>		
	- the role of an engineer, engineering calcs.,		
	measurements, dimensions basic units		
	- uncertainty, sig. figures, estimating errors		
Sept. 19	The Engineering Design Process	P1-Engineering	
	 engineering design; design process 	Approximations	
	- problem definition, constraints & criteria		
	- the design loop		
Sept. 26	Preliminary Ideas & Design Teams	P2-DesignProcess: Problem	
	- team organization & dynamics	Definition	
	- design notes, information gathering		
	- information gathering, brainstorming		
Oct. 3	Problem Analysis & Recourses Planning	P3-DesignProcess:	
	- analysis of design process	Preliminary Design Ideas	
	- time & resource planning & scheduling		
	- CPM &Gantt Charts		
Oct. 10	Decision-Making	P4-Project Planning &	
	- evaluating alternatives	Scheduling	
	- basic decision-making method	8	
	- decision matrix; criterion functions		
Oct. 17	Design Implementation & Reporting	P5 - Information Sources	
	- design reports; final presentation,	Exercise	
	demonstration and report		
Oct. 24	Mid-Term Examination	P6-Term Project:	
		Preliminary Design	
Oct. 31	Economic Analysis	No lab assigned	
	- cost considerations converting between		
	types of cost		
	- equivalent uniform annual cost		
	- Cash flow diagrams		
Nov. 7	Professional Practice & Code of Ethics	P7 - Engineering Design	
1.0117	-engineering is a profession, PEO	and Economic Analysis	
	membership & code of ethics		
	- engineering seal, iron ring		
Nov. 14	Technical Presentations	P8 - Engineering Ethics	
	- preparation of material		
	- delivery, visual aids. formal meetings		
Nov. 23	Contemporary Engineering	P9 - Critical Evaluations	
	- special lecture		
Nov 28	Course Review & Evaluation	Projects Presentations	

Problems Solving Section (Schedule of Topics)

Week	Lecture Material (every Thursday)	Graphics Lab Assignment	
Sept. 12	Intro. To Engineering Graphics - importance of engineering graphics - tools; pencil & paper, CAD - visualization_scale_angles of projection	G1-Introduction to SOE Computing Facilities.	
G 10	- type of CAD modeling		
Sept. 19	Graphics and Communications Basics Engineering drawing layout and elements engineering office communications design notes and calculations	G2-Hand Sketching	
Sept. 26	<u>Communication by Graphs</u> - effectiveness for communicating ideas - types, key elements - spreadsheet as a design tool	G3-Intro to AutoCAD LT 2000	
Oct. 3	Views & Projections - multi-view drawings, 3-view drawings - orthographic projection, types	No lab assigned	
Oct. 10	Engineering Communications - email, memos & letters design notes, - technical letters; technical reports - letter of transmittal	G4-AutoCad LT 2000 Basic	
Oct. 17	<u>Advanced Spreadsheets</u> - some concepts, functions, formulas - modeling, calculation - dimensioning, types of dimensioning	G5-Orthographic Projection	
Oct. 24	Sectional Views - definition, types - sections as views	G6-Graphs by Excel	
Oct. 31	<u>Auxiliary Views</u> - definition, types of auxiliary views - drawing an auxiliary view	No lab assigned	
Nov. 7	<u>Advanced Graphics</u> - 3D projection, pictorial drawing - isometric and oblique projection	G7–Sectional & Auxiliary views	
Nov. 14	<u>Graphics Summary</u> - putting it all together concept - engineering final drawings - working and CAD drawings	G8-Detailed Drawing & Isometric projection	
Nov. 21	Professional Practice - special lecture	Graphics Lab Final Exam	
Nov. 28	Course Review and Makeup lecture	No lab assigned	

Graphics Section (Schedule of Topics)