ENGG*1100 Engineering & Design I
Fall 2014

School of Engineering

(September 3, 2014 – CourseLink Posted)

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1 INSTRUCTIONAL SUPPORT

1.1 Instructor

Instructor: Warren Stiver, Ph.D., P.Eng.
Office: THRN 1343, ext. 54862
Email: wstiver@uoguelph.ca
Office hours: By appointment

1.2 Technician

Technician: Alex Galvez
Office: THRN 2363, ext. 53663
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1.3 Teaching Assistants

GTA	Email	Office Hours	Married to Section
Ammar Abu Leil	aabuleil@uoguelph.ca	None	0105
Caroline Charbonneau	ccharbon@	None	0103
Mark De Lange	mdelange@	None	0110
Lynn Dony	ldony@	None	0111
Erika Fiedler	efiedler@	None	0106
Clayton Gionet	cgionet@	None	0102
Adam Moore	amoore03@	None	0108
Gurvinder Mundi	gmundi@	None	0101
David Rogala	drogala@	None	0112
Cody Thompson	cthompso@	None	0107
Emma Thompson	thompsoe@	None	0110

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, announcements will be regularly posted to the ENGG*1100 Courselink site. You are responsible for checking the site regularly.

2.2 Required Resources

1. Andrews G.C., Aplevich J.D., MacGregor C., Fraser R.A., *Introduction to Professional Engineering in Canada*, 4th Edition, Prentice Hall, 2015
2. Log Book and Sketch pad

2.3 Recommended Resources

NONE.

2.4 Additional Resources

Lecture Information: All the lecture notes are posted on Courselink (week #1-#12). These notes are skeleton in character. Do not consider these sufficient to gain the required knowledge, skills or thinking.

Lab Information: The handouts for all the lab sessions are posted on the Courselink site. All types of resources regarding tutorials, links to web pages can be found in this section.

Assignments & Project Information: This will be posted on the Courselink site.

Quizzes & Exams: Samples of quizzes from F2013 will be posted on Courselink. The F2013 Final Exam will be posted as well.

Miscellaneous Information: Other information related to the course will be posted on Courselink site.

2.5 Communication & Email Policy:

Please use lectures and lab help sessions as your main opportunity to ask questions about the course. Major announcements will be posted to the Courselink site. **It is your responsibility to check the course website regularly.** As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its student.

3 ASSESSMENT

3.1 Dates and Distribution

Item	Grade	Date(s)
Final Exam (Individual)	20%	Tuesday December 2nd, 7:00 – 9:00 pm
Design Project (Team) Performance Documentation	40% 20% 20%	 In Lab Nov 19-25th DUE Thursday, Nov 28th, 11:00 pm
Lab Quizzes (3, Individual)	15%	In Lab Weeks 4, 6 & 10
Innovation Drawing (Individual)	10%	Due Saturday, Nov 15th, 5:00pm
In Lab Assignments for Design and Visual process development (Mix)	10%	Some Pass / Fail and some Graded Approx. 10 in total and equally weighted Majority assigned and completed in Lab
3D Building (Team)	5%	In Lab Nov 19-25th

3.2 Course Grading Policies

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please email the course instructor. See the undergraduate calendar for information on regulations and procedures for Academic Consideration:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor at the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Passing Grade: The passing grade for this course is 50%.

Lab Work: You are expected to attend and participate in all laboratories. You may only attend your scheduled section. Prof. Stiver's permission is required for you to attend an alternate. If you complete an assessment in an alternate section without Prof. Stiver's permission then your assessment will not count.

Missed items: There will be no makeup for missed individual in-lab assignments or in-lab quizzes. If you are granted academic consideration (medical or compassionate) or religious accommodation, the weight of the missed item will be added to the corresponding parallel items.

Late: Late submissions will not be accepted.

Team Work: If there is some observation or evidence that you have not been an approximately equal contributor to your team's work then you will be asked to provide evidence of your

individual efforts, contributions and results. A logbook is a required means to help demonstrate your contributions. Low contributions may lead to a lower grade than the "team grade" or, in more extreme cases, academic misconduct policies being applied. Prof. Stiver will be meeting with all teams during the labs in Weeks 6 and 10.

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4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

4.1 Calendar Description

Introduction to engineering and design by means of selected problems. 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.

Restriction: Registration in the B.Eng. Program

4.2 Course Aims

The aim of the course is an introduction to engineering design and to Guelph's sequence of design courses, an introduction to expectations of the profession in spirit and specifics, to establish a collaborative and team philosophy around learning and engineering, and to stimulate enthusiasm through the successful completion of a design challenge. Finally to initiate the development of independent learning skills that are essential for success in engineering education and engineering careers.

4.3 Learning Objectives

At the successful completion of this course, the student will have demonstrated the ability to:

1. ***Describe (1)*** *a systematic engineering design process (EXAM)*
2. ***Design (6)*** *a solution to a defined engineering problem relying on high school background and first year engineering principles (DESIGN PROJECT)*
    a. ***Demonstrate (3)*** *command of constraints and criteria.*
    b. ***Integrate (5)*** *simple engineering analysis to defend and advance your design*
3. ***Produce (3)*** *engineering design documentation in written, oral and graphical (visual) forms with an emphasis on the graphical (LAB ASSIGNMENTS, DESIGN PROJECT)*
    a. *Prepare engineering drawings of design ideas and across engineering disciplines*
    b. *Explain engineering drawings across engineering disciplines*
4. ***Construct (3)*** *solutions with the aid of engineering tools (e.g. CAD, spreadsheet, programming and hand tools) (LAB ASSIGNMENTS, DESIGN PROJECT)*
5. ***Describe (1)*** *overall professional engineering responsibilities with particular emphasis in terms of ethics and safety (EXAM)*
6. ***Analyze (4)*** *existing and historical engineering designs (EXAM)*
7. ***Practice*** *individual and team work and project management necessary for learning and project completion on time. (IN LAB, DESIGN PROJECT)*

4.4 Graduate Attributes

Successfully completing this course will contribute to the following CEAB Graduate Attributes:

Graduate Attribute	Learning Objectives	Assessment
1. Knowledge Base for Engineering		
2. Problem Analysis		
3. Investigation		
4. Design	1, 2, 3	Exam, In Lab Assignments, Design Project
5. Use of Engineering Tools	4	Exam, In Lab Assignments, Design Project, Visual Communication
6. Communication	3	Exam, In Lab Assignments, Design Project Documentation, Visual Communication
7. Individual and Teamwork	7	In Lab Assignments, Design Project, Visual Communication
8. Professionalism	5, 6	Exam
9. Impact of Engineering on Society and the Environment	5, 6	Exam, Design Documentation
10. Ethics and Equity	5, 6	Exam
11. Business & Project Management		
12. Life-Long Learning		

4.5 Instructor's Role and Responsibility to Students

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courselink/D2L but these are not intended to be stand-alone course notes. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for tests and project.

4.6 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and labs. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

Students will be working in teams and in a collaborative learning environment. You are responsible to be an active contributor to your teams. You are responsible to maintain a personal logbook that documents your teamwork. Courselink provides an overview of the expected use and content of your logbook.

4.7 Relationships with other Courses & Labs

Previous Courses:

Hopefully all of your previous education proves valuable.

Con-Current Courses:

ENGG*1210: Design project will rely on Physics (high school) and mechanics.

CIS*1500: Programming the Arduino Microcontroller will complement your programming course.

HIST*1250: Some of the engineering cases will complement an historical look at the technology and society.

Follow-on Courses:

ENGG*2100, 3100, 41x0: Engineering & Design II, III & IV

ENGG*3/4XX: Each engineering program has at least 3 additional design courses.

ENGG*XXXX: A very large fraction of your program will encourage and/or rely on collaborative, team learning approaches.

5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable

Lectures (All sections):
Tuesday 7:00 – 8:50 pm ROZH 101

Labs (You may only attend your scheduled lab sections):

Section	Computer Lab (THRN 2313)	Design Lab (THRN 1435)
0101	Monday 8:30 – 10:20 am	Friday 8:30 – 10:20 am
0102	Friday 8:30 – 10:20 am	Monday 8:30 – 10:20 am
0103	Wednesday 9:30 – 11:20 am	Thursday 2:30 – 4:20 pm
0104		
0105	Monday 2:30 – 4:20 pm	Wednesday 2:30 – 4:20 pm
0106	Wednesday 2:30 – 4:20 pm	Monday 2:30 – 4:20 pm
0107	Monday 12:30 – 2:20 pm	Friday 12:30 – 2:20 pm
0108	Friday 12:30 – 2:20 pm	Monday 12:30 – 2:20 pm
0109	Wednesday 12:30 – 2:20 pm	Friday 2:30 – 4:20 pm
0110	Friday 2:30 – 4:20 pm	Wednesday 12:30 – 2:20 pm
0111	Tuesday 12:30 – 2:20 pm	Thursday 11:30 am – 1:20 pm
0112	Thursday 11:30 am – 1:20 pm	Tuesday 12:30 – 2:20 pm

The Design and Computer labs will start on Monday September 8th and end on Tuesday November 25th resulting in 11 sessions for each section in each lab. There are no labs on Thursday September 4th, Friday September 5th, Monday October 13th (Thanksgiving), Tuesday October 14th (Fall Study Break Day) or Wednesday to Friday November 26-28th.

The course carries a 0.75 credit weight. A typical "B" student is expected to require approximately 15 hours per week to receive a "B" grade in a course with this weighting. This15 hours includes the 6 hours per week of scheduled contact hours (2 hours in lecture and 4 hours in labs).

5.2 Lecture Schedule (approximate, subject to shift at the discretion of the instructor)

Lectures	Lecture Topics	References	Learning Objectives
1	Welcome plus	Course Outline	
1 - 4	Engineering Design & Design Process - Objectives, Scope, Constraints, Criteria - Design process, cycle and iterations - Decision Making	Chapter 15 + Courselink	1, 2, 3
5 - 8	Professionalism & Practice - Professional Engineering Role and Expectations - Accreditation - Licensure & Your Portfolio - Professional Documentation - Accreditation - Project Management	Ch 1, 2, 3, 18 + Courselink	5, 6
9 - 12	Engineering Cases – Design, Ethics & Safety - Ethical Theories & Philosophies - Cases raising ethical, design, safety and sustainability questions	Ch 3, 19, 20, 21 + Courselink	5, 6
12	Wrap-up		

Note: there is no Lecture on Tuesday October 14th (Fall Study Day), there will be a lecture on Thursday November 27th as makeup for Fall Study Day

5.3 Design & Computer Lab Approximate Schedule

Week	Dates	Computer Lab (THRN 2313)	Design Lab (THRN 1435)
1	Sept 8 - 12	Introduction to Computers AutoCad 1	Team & Design Exercises
2	Sept 15 - 19	Arduino 1, AutoCad 2 (Electrical)	Sketch 1 - Perspective
3	Sept 22 - 26	AutoCad 3 (Architectural, Civil)	Design Project Launch, Team forming, Constraints Exercise
4	Sept 29 – Oct 3	Quiz 1, Arduino 2	Sketch 2 – Right Brain
5	Oct 6 – 10	AutoCad 4 (Process)	Ideas Exercises
6	**Wed** Oct 15 – Tues 21	Quiz 2, Solid Works 1 (Mechanical)	Safety Exercise Initial Team Chat
7	Oct 22 – 28	Spreadsheets	Measurement, Criteria Exercise
8	Oct 29 – Nov 4	Solid Works 2 (Mechanical)	Life Cycle Exercise
9	Nov 5 – 11	Innovation Drawing Support	Sketch 3 – Viewing Plane
10	Nov 12 – 18	Quiz 3, AutoCad 5 (Control)	Aesthetic Assessment Open Testing Second Team Chat
11	Nov 19 – 25	Solid Works 3 – 3D Campus Bldg	Design Assessment, Kit Returns

Note: no labs on Sept 4 and 5, no labs on Oct 13 and 14, and no labs on Nov 26, 27, 28.

5.4 See 5.3

5.5 Other Important Dates

Monday, 13 October 2014: Thanksgiving holiday, no classes
Tuesday, 14 October 2014: Fall Study Break Day, no classes
Friday, 31 October 2014: 40th class day – last day to drop one-semester courses
Thursday, 27 Nov 2014: Tues Schedule in effect as make up for Fall Study Break Day
Friday, 28 November 2014: Monday Schedule in effect as make up for Thanksgiving

6 LAB SAFETY

6.1 School of Engineering Policy

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.

6.2 ENGG*1100 Specific

The computer labs are largely limited to computer use only – this does not raise any special safety issues. A few computer labs will work with an Arduino Microcontroller, 9V batteries and small electrical motors. The computer connection to the Arduino is via the USB port. There are no significant safety issues introduced.

One of the capacitors is polarized and will explode (pop) if connected backwards or shorted. You are required to wear safety glasses in the computer lab when we are first working with this. You are required to provide a simple paper or cardboard enclosure for this item in your design. It is recommended that you wear safety glasses when working with this capacitor prior to your enclosure being installed.

In the design labs, you will be using Mecanno (suitable for ages 8+), Arduino Microcontroller (suitable for teenager+ usage), wrenches, screwdrivers, wire strippers, 9V batteries and other similar small hobby, low risk tools and components.

The student shop space is available for your project work and for project storage. Two teams will share one project storage cage.

Requirements for Student Shop Usage

- Safety glasses on at ALL times
- Leave the space as clean or cleaner than when you arrived
- Do not let other students in – if they have permission to use the space then their card works at the door.
    - If their card doesn't work then it may be because they have lost permission based on previous actions
- Do not work alone

Working mobile storage units & mobile stairs (verbally communicated & demonstrated)

- Check that the space is clear between mobile storage units
- Press stop on the units
- Press the Move button on the unit you wish to move (other units between this one and the gap will also move)
- Access your storage unit – do not leave your unit's doors open even if you are working a few feet away
    - THIS IS FOR REASONS OF SAFETY AND RESPECT OF OTHERS

- IF you have a unit on the top row (or 3rd row for some of you) then you need to use the mobile stairs to safely access your unit
    - The stairs have two levers. One to engage the wheels so that the stairs roll freely. One to disengage the wheels so that it is safe to climb the stairs without it rolling. DO NOT CLIMB THE STAIRS IF THE WHEELS ARE ENGAGED.
- WATCH YOUR HEAD FOR OPEN DOORS ON THE 3RD OR 4TH LEVEL OF THE STORAGE SYSTEM.

7 ACADEMIC MISCONDUCT

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

7.1 Resources

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:
http://www.academicintegrity.uoguelph.ca/

Please also review the section on Academic Misconduct in your Engineering Program Guide.

The School of Engineering has adopted a Code of Ethics that can be found at:
http://www.uoguelph.ca/engineering/undergrad-counselling-ethics

7.2 ENGG*1100 Specifics

ENGG*1100 requires a combination of individual and teamwork to successfully complete this course. Collaborative learning will be encouraged throughout. It will be clearly stated when an assessment is to be an individual exercise, when it is a team exercise and when it is wide open for collaborative work.

Do not include your University of Guelph Student Number on your submissions.

Do not include your PEO Student Membership Program (SMP) number on your submissions (this does contradict the SOE's Code of Ethics).

Do include your first (commonly used name) and last name and do include your University CFS Login ID.

In the event that there is some reason to believe that you are not or have not fairly contributed to the work of your team then you will be required to submit your Log Book to aid judgment regarding academic misconduct.

8 ACCESSIBILITY:

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability for a short-term disability should contact the Centre for Students with Disabilities as soon as possible For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.csd.uoguelph.ca/csd/

9 RECORDING OF MATERIALS

Presentations which are made in relation to course work cannot be recorded or copied without the explicit permission of the presenter (Alex Galvez, classmate, guest lecturer or GTA). Material recorded with permission is restricted to use for that course unless further permission is granted.

Professor Stiver grants you permission to record or copy his lectures or other material and to freely use this material for your use only within ENGG*1100 and any of your other University of Guelph courses (suitable citation is expected). Use of this material beyond the University of Guelph requires further permission.

10 RESOURCES

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: http://www.uoguelph.ca/registrar/calendars/index.cfm?index