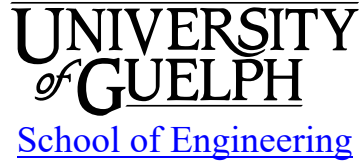




ENGG*1100 Engineering & Design I

Fall 2019



(Version: September 6, 2019)

1 INSTRUCTIONAL SUPPORT

1.1 Instructors

Instructor: John Donald, Ph.D., P.Eng.
Office: RICH 2503, ext. 53084

Email: jrdonald@uoguelph.ca
Office hours: By appointment

Instructor: Cameron Farrow, Ph.D., E.I.T.
Office: RICH 1515, ext. 53838

Email: cfarrow@uoguelph.ca
Office hours: By appointment

1.2 Technician

Technician: Alex Galvez
Office: THRN 2363, ext. 53663

Email: agalvez@uoguelph.ca

1.3 Teaching Assistants

Lab Section(s)	Name	Email	Office Hours
0101	Mohamed Aly	maly@uoguelph.ca	During Lab
0102	Rahul Eswar	reswar@uoguelph.ca	During Lab
0103	Olivia Roud	oroud@uoguelph.ca	During Lab
0104	David Nguyen	dnguye09@uoguelph.ca	During Lab
0105	Joseph Lee	jlee53@uoguelph.ca	During Lab
0106	Jacob Sakhnini	jsakhnin@uoguelph.ca	During Lab
0107	Alexander Moksyakov	amoksyak@uoguelph.ca	During Lab
0108	Ryan Byerlay	rbyerlay@uoguelph.ca	During Lab
Computer	Stephanie Hughes	shughe02@uoguelph.ca	During Lab
Computer	Karan Shukla	kshuk102@uoguelph.ca	During Lab

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. Ewald, Thorsten, *Writing in the Technical Fields: A Practical Guide*, 2nd Edition, Oxford University Press, 2017.
2. Log Book.
3. I-clickers for quizzes.

2.3 Recommended Resources

1. Andrews G.C., Aplevich J.D., MacGregor C., Fraser R.A., *Introduction to Professional Engineering in Canada*, 5th Edition, Prentice Hall, 2018.

2.4 Additional Resources

Lecture Information: Lecture material will be posted on Courselink. These notes are meant to supplement lectures, and are not complete on their own.

Lab Information: Information related to the lab sessions such as handouts and links to web pages will be posted on Courselink.

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

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

2.5 Communication & Email Policy:

Please use lectures and lab sessions as your main opportunity to ask questions about the course.

- Major announcements will be posted to Courselink.
- **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 students.
- E-mails to course instructors and GTA's should have **ENGG*1100 in the subject line.**

3 ASSESSMENT

3.1 Dates and Distribution

Item (Individual or Team)	Grade	Date(s)
Final Exam (Individual)	20%	Monday December 2, 7-9 p.m.
Design Project (Team) ...Prototype Testing (5%) Performance (10%) Final Report (25%)	40%	Prototype testing <ul style="list-style-type: none">• THRN 1435 Labs - Oct. 21st to 25th.• Interim Report due 2 days after Lab (6:00 pm) Performance - THRN 1435 Labs - Nov. 18 th to 22 nd . <ul style="list-style-type: none">• TBWC Events Final Report <ul style="list-style-type: none">• Aesthetics - due Sat Nov 9th (6:00 pm)• Appendix - due 2 days prior to Performance (6:00 pm)• Main Body due 2 days after Performance (6:00 pm)
Design Project (Individual) ...Self & Peer Review 1 (2%) ...Self & Peer Review 2 (3%)	5%	Self & Peer Review 1 <ul style="list-style-type: none">• 4 days after Prototype Testing (6 pm) Self & Peer Review 2 <ul style="list-style-type: none">• 4 days after Performance (6 pm)
Lab Quizzes (6, Individual)	19%	In THRN 1319 or THRN 1435 Lab -- Weeks 2, 4, 8 & 10
Clicker Quizzes	5%	Approximately once per week in Lectures
Log Book Checks (Individual) #	3%	THRN1435 Lab -- Weeks 3, 5, 10
Stewardship Assignment – Photo Essay (Individual)	3%	Due Sat Oct 12 th , 6:00pm
Innovation Assignment - Idea Communication (Individual)	5%	Due Sat Nov 2 nd , 6:00pm
SOE Safety Quiz - Student Green Card (Individual)	P/F	Failure to pass the SOE Safety Quiz to obtain your Student Green Card will result in an Incomplete grade for the entire course.

#Note: Log books have significance beyond this 3% for individuals who are not equal contributors to their teams. See note in Section 3.2 on team work.

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. Professor Donald's permission is required for you to attend an alternate. If you complete an assessment in an alternate section without Professor Donald's permission, then your assessment will not count.

Missed items: There will be no makeup for missed individual 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 in-lab quiz items.

Late: Late submissions will not be accepted.

Certification: Students must write their PEO SMP (Student Membership Program) number on all submitted work. This signifies that the SOE Code of Ethics was adhered to.

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. Evidence such as logbooks and/or other indicators such as self & peer assessments may trigger meetings with individuals and/or teams regarding contributions.

Student Green Card: If no members of your design team hold a student green card then your team will not be able to use the student project storage space or the student shop space. You will need to meet these needs on your own. Failure to pass the SOE Safety Quiz to obtain your Student Green Card will result in an Incomplete grade for the entire course.

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** a systematic engineering design process.
2. **Design** a solution to a defined engineering problem relying on high school background and first year engineering principles

- a. **Demonstrate** command of constraints and criteria.
 - b. **Integrate** simple engineering analysis to defend and advance your design.
3. **Produce** engineering design documentation in written, oral and graphical (visual) forms with an emphasis on the graphical.
 - a. Prepare engineering drawings of design ideas and across engineering disciplines
 - b. Explain engineering drawings across engineering disciplines
4. **Construct** solutions with the aid of engineering tools (e.g. CAD, spreadsheet, computer programming and hand tools).
5. **Describe** overall professional engineering responsibilities with particular emphasis in terms of ethics and safety.
6. **Analyze** existing and historical engineering designs.
7. **Practice** individual and team work and project management necessary for learning and project completion on time.

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, Assignments, Project, Reports, Quizzes
5. Use of Engineering Tools	4	Exam, Assignments, Project, Reports, Quizzes
6. Individual and Teamwork	3,7	Assignments, Project, Reports, Quizzes
7. Communication	3	Exam, Assignments, Project, Reports, Quizzes
8. Professionalism	5, 6	Exam
9. Impact of Engineering on Society and the Environment	5, 6	Exam, Assignments, Reports, Quizzes
10. Ethics and Equity	5, 6	Exam, Quizzes
11. Economics & Project Management	7	Exam
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 tutorials. 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. The University Academic Calendar <http://www.uoguelph.ca/registrar/calendars/index.cfm?index> and School Program guides <https://www.uoguelph.ca/engineering/content/resources/guides> are both essential resources.

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

Con-Current Courses:

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

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.

Concurrent Pedagogical Research:

Students in this course will be invited to participate in an “Engineering Team Dynamics” research study about the impact of team dynamics and social interactions on students’ academic trajectories early in their engineering education. This research will advance understanding of barriers to undergraduate’s long-term engagement and academic success in STEM, so participants will be asked to release their academic records for this research. Participation is voluntary and should take less than 45 minutes (total); choosing not to participate will not impact your relationship with the University of Guelph or your course standing in any way. This study has been reviewed and received clearance through research ethics committees at the Universities of Guelph and Waterloo.

5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable

Lectures (All sections):

Wednesday 7:00 – 8:50 p.m. WMEM 103

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

Section	Computer Lab (THRN 1319)	Design Lab (THRN 1435)
0101	Wednesday 2:30 – 4:20 pm	Friday 2:30 – 4:20 pm
0102	Friday 2:30 – 4:20 pm	Wednesday 2:30 – 4:20 pm
0103	Monday 2:30 – 4:20 pm	Thursday 8:30 – 10:20 am
0104	Thursday 8:30 – 10:20 am	Monday 2:30 – 4:20 pm
0105	Friday 8:30 – 10:20 am	Tuesday 8:30 – 10:20 am
0106	Tuesday 8:30 – 10:20 am	Friday 8:30 – 10:20 am
0107	Wednesday 11:30 – 1:20 pm	Monday 11:30 – 1:20 pm
0108	Monday 11:30 – 1:20 pm	Wednesday 11:30 – 1:20 pm

Lab Start Dates: The Design and Computer labs will start on Monday September 9th and end on Friday November 29th resulting in 11 sessions for each section in each lab.

Dates with no Labs: There are no labs on Thursday September 5th, Friday September 6th, Monday October 14th (Thanksgiving), Tuesday October 15th (Fall Study Break Day), Wednesday October 16th, Thursday October 17th, or Friday October 18th.

Additional Note:

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. This 15 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 instructors)

Lectures	Lecture Topics	Learning Objectives
Week 1	Course Overview and Introduction to Engineering	5
Week 2	Engineering Communication, Teams, Project Management	3, 5, 7
Week 3	Engineering Design Process & Communication	1, 2, 3, 6
Week 4	Engineering Design Process & Communication	1, 2, 3, 6
Week 5	Professional Engineering and Practice	5, 6
Week 6	Engineering Communication: Graphics, Report, Reflection	3, 7
Week 7	Sustainable Design	5, 6
Week 8	Engineering Ethics	5, 6
Week 9	Design for Safety	5, 6
Week 10	Special Topic in Engineering Design	5, 6
Week 11	The 21 st Century Engineer	5, 6
Week 12	Course Wrap Up	5

5.3 Design & Computer Lab Approximate Schedule

Week	Dates	Computer Lab (THRN 1319)	Design Lab (THRN 1435)
1	Sept 9 – 13	Introduction to Computers, SolidWorks 1	Team & Design Exercises
2	Sept 16 – 20	SolidWorks 2, Orthographic Projection	Sketch 1 – Perspective
3	Sept 23 – 27	SolidWorks 3	Design Project Launch, Team forming
4	Nov 30 - Oct 4	Lab Quiz 1 (SolidWorks)	Intro to Arduino, Breadboard, Circuits
5	Oct 7-11	Introduction to Excel	Idea Generation
6	Oct 14 – 18	NO LABS	NO LABS
7	Oct 21 – Oct 25	Lab Quiz 2 (Spreadsheets)	Design Prototype Performance
8	Oct 28 – Nov 1	AutoCAD 1	Design/Ethics Exercises
9	Nov 4 – 8	AutoCAD 2	Ethics Quiz
10	Nov 11 – 15	Lab Quiz 3 (AutoCAD)	Aesthetics Assessment
11	Nov 18 – 22	Design Project	Design Project Performance
12	Nov 25 – 29	Project Wrap Up	Project Wrap Up

Note: No labs on Sept. 5th & 6th, Oct. 14th to Oct. 18th.

5.4 Other Important Dates

Monday, October 14th - Thanksgiving holiday, no classes

Tuesday, October 15th - Fall Study Break Day, no classes

Thursday, November 28th - Tuesday Schedule in effect. Make up for Fall Study Break Day

Friday, November 29th - Monday Schedule in effect. Make up for Thanksgiving

5.5 Drop Date

Students will have until the last day of classes to drop courses without academic penalty.

The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

5.6 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

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. A few computer or design labs will work with an Arduino Microcontroller, DC 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 used in the project 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.

In the design labs, you will be using Meccano (suitable for ages 8+), Arduino Microcontroller (suitable for teenager+ ages), wrenches, screwdrivers, wire strippers, DC 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. You are required to have a "Student Green Card" to access and use the project storage space and to use the student shop space. To obtain your Student Green Card you must review the

online lecture and supporting material in the Courselink Course “SOE Machine Shop” and pass the Green Card Safety Quiz that accompanies the “SOE Machine Shop” course.

Requirements for Student Shop Usage

- Safety glasses on at **ALL** times.
- Leave the space as clean as or cleaner than when you arrived.
- Do not let other students in – if they have access permission their card works at the door.
- Do not work alone.

Working mobile storage units & mobile stairs

- 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
- Accessing your storage unit
 - Do not leave your unit’s doors open even if you are working a few feet away.
- Accessing units using mobile stairs
 - If you have a unit on higher rows (3rd and 4th) use the mobile stairs to safely access unit.
 - The mobile 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 INTEGRITY

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 encourages academic integrity. 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 or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

The School of Engineering has adopted a Code of Ethics that can be found at:

<https://www.uoguelph.ca/engineering/content/resources/code>

7.1 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.

In the event 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 adjustment of “team” grade for project and/or for academic misconduct.

7.2 The Use of Turnitin

This course uses Turnitin (integrated with the CourseLink Dropbox tool) to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph. Submitted assignments will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

A major benefit of using Turnitin is that students can educate and empower themselves in preventing academic misconduct. In this course, you may screen your own assignments through Turnitin as many times as you wish before the due date. You will be able to see and print reports that show you exactly where you have properly and improperly referenced the outside sources and materials in your assignment.

8 ACCESSIBILITY:

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

9 RECORDING OF MATERIALS

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

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:

Academic Calendars

<https://www.uoguelph.ca/academics/calendar>