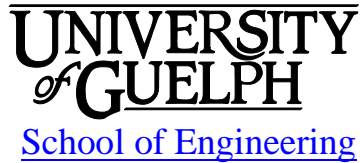


# ENGG\*3100 Engineering & Design III

## Winter 2018



(Revision 0: January 4, 2018)

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## 1 INSTRUCTIONAL SUPPORT

### 1.1 Instructor

Instructor: Manick Annamalai, Ph.D., P.Eng.  
Office: THRN 2401, ext. 53499  
Email: [mannamal@uoguelph.ca](mailto:mannamal@uoguelph.ca)  
Office hours: By appointment

Instructor: Andrea Bradford, Ph.D., P.Eng.  
Office: THRN 1342, ext. 52485  
Email: [abradfor@uoguelph.ca](mailto:abradfor@uoguelph.ca)  
Office hours: By appointment

Instructor: Ahmed Mahmood, Ph.D., P.Eng.  
Office: THRN 2361, ext. 58451  
Email: [am Mahmood@uoguelph.ca](mailto:am Mahmood@uoguelph.ca)  
Office hours: By appointment

Instructor: Ping Wu, P.Eng.  
Office: THRN 2361, ext. 58451  
Email: [pingwu@uoguelph.ca](mailto:pingwu@uoguelph.ca)  
Office hours: By appointment

### 1.2 Teaching Assistants

<u>GTA</u>	<u>Email</u>	<u>Office Hours</u>
Wahbi El-bouri	<a href="mailto:welbouri@uoguelph.ca">welbouri@uoguelph.ca</a>	During lab time
Viktor Lidkea	<a href="mailto:vlidkea@uoguelph.ca">vlidkea@uoguelph.ca</a>	During lab time
Alison Gowman	<a href="mailto:agowman@uoguelph.ca">agowman@uoguelph.ca</a>	During lab time
Drew Anderson	<a href="mailto:dander04@uoguelph.ca">dander04@uoguelph.ca</a>	During lab time
Stephen Stajkowski	<a href="mailto:stajkows@uoguelph.ca">stajkows@uoguelph.ca</a>	During lab time
Rudy Wong	<a href="mailto:rudy@uoguelph.ca">rudy@uoguelph.ca</a>	During lab time
Samantha Mehlretter	<a href="mailto:mehltres@uoguelph.ca">mehltres@uoguelph.ca</a>	During lab time
Vithursan Thangarasa	<a href="mailto:vthangar@uoguelph.ca">vthangar@uoguelph.ca</a>	During lab time

## 2 LEARNING RESOURCES

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### 2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the ENGG\*3100 Courselink site. You are responsible for checking the site regularly.

### 2.2 Required Resources

None

### 2.3 Recommended Resource to Improve Your Technical Writing Skills

Please see Courselink for recommended resources throughout the term.

### 2.4 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 the course website. **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 professors should have ENGG\*3100 in the subject line.

### 3 ASSESSMENT

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#### 3.1 Dates and Distribution

	<b>Assessment Item</b>	<b>Worth</b>	<b>Due Date</b>	<b>Submission Format</b>
Project Management	Team & Project Selection	2%	Jan 19, 4:30 pm	electronic on Courselink
	Project Management	8%	Updates Weeks 5, 7, 9, 11 before Fri, 4:30 pm	team project website
Design Proposal	Design Proposal*	10%	Week 4 Jan 29 – Feb 1	electronic on Courselink
	Proposal Process Reflection Form 1	Pass/Fail	Week 5 Feb. 9, 11:59 pm	electronic on Courselink
Preliminary Design Report	Preliminary Design Report	20%	Week 6 Feb 12 – Feb 15	electronic on Courselink
Technical Design Review & Presentation	Design Review Technical Memo	10%	Week 8 Mar 5 – Mar 8	electronic on Courselink
	Design Cost Memo	10%	Week 9 Mar 12 – Mar 15	electronic on Courselink
	Design Review Presentation	10%	Week 10 Mar 19 – Mar 22	electronic on Courselink & presented in labs and in lectures (week 10)
Final Design Report and Reflection	Final Design Report*	25%	Week 12 Apr 2 – Apr 5	electronic on Courselink
	Peer Evaluation Final Report Reflection Form 2	5% Pass/Fail	Apr 9, 11:59 pm	electronic on Courselink

\*Note: deliverables with the \* require satisfactory completion of a “Process Reflection Form” to be completed individually by the due date. Failure to complete this form will result in an “Incomplete” grade for the individual student on that deliverable.

Deliverables are due the same day as the lab section during the week specified. That is, deliverables for students in the Monday lab sessions are due on Mondays, Tuesday Lab sessions are due Tuesday, Wednesday Lab sessions are due Wednesday and Thursday Lab sessions are due Thursday. Unless otherwise specified, all deliverables are to be submitted electronically through Courselink before 11:59 PM.

- Students are required to back-up work frequently and keep copies of all submitted work for your own protection and for possible re-submission if requested.

## 3.2 Course Grading Policies

**Accommodation of Religious Obligations:** If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of 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>

**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>

### Late Submission Penalties:

- 10% penalty if the report is less than 1 hour late (as denoted by Courselink).
- 40% penalty if the report is between 1 hour and 24 hours late.
- 80% penalty if the report is between 24 and 48 hours late.
- 100% penalty (i.e., zero) if the report is more than 48 hours late.

### Individual and Team Assessments:

- Individual grades may differ from team grades in positive and negative ways
  - Individuals not carrying their weight (quality or quantity) based on peer comments and/or instructor observations may receive a reduced grade. A severe quantity issue may lead to academic misconduct.
  - Individuals serving as exceptional leaders based on peer comments and/or instructor observations may be awarded a bonus.
- Individuals are required to keep track of their individual efforts throughout the semester – individual meeting notes, design ideas, design analysis work, etc. The professors may request to see this individual information when a reduced grade is being considered. This information will be useful to generate the project management updates, which are to be posted on the team project management website, as well as the reflections.

**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. For group projects, students must also state that they contributed to the group effort in an equitable manner. (The PEO Student Membership Program (SMP) offers you a free opportunity to keep informed about PEO issues and links you to PEO's licensing process. You may join by visiting the PEO web site:  
<https://members.peo.on.ca/SMP/register.php>).

**Passing grade:** In order to pass the course, you must obtain a final grade of 50% or higher. If a student feels that a particular deliverable was graded unfairly, or if there is an error in the grading, it should be brought to the attention of the Instructor within one week after the grade is posted on Courselink. Scores posted on Courselink will not be reconsidered beyond this period.

## 4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

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### 4.1 Calendar Description

This course combines the knowledge gained in the advanced engineering and basic science courses with the design skills taught in ENGG\*1100 and ENGG\*2100 in solving open-ended problems. These problems are related to the student's major. Additional design tools are presented, including model simulation, sensitivity analysis, linear programming, knowledge-based systems and computer programming. Complementing these tools are discussions on writing and public speaking techniques, codes, safety issues, environmental assessment and professional management. These topics are taught with the consideration of available resources and cost.

*Prerequisite(s):* Registration in the B.Eng. program and completion of 6.00 credits of ENGG courses including ENGG\*2100

*Restriction(s):* Students must have a minimum cumulative average of 60% or higher in ALL ENGG courses. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

University of Guelph Credits: 0.75 (Nominally 15 h per week for a B student to earn a B)

### 4.2 Course Aims

This course builds on the design skills taught previously and focuses on a project-based model of learning. The lab time is designed to use a studio-style pedagogical approach to design. Each student is to apply the knowledge that they learned in their discipline-specific courses in the design environment.

### 4.3 Learning Objectives

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

1. Apply skills and knowledge from core and program specific engineering courses to a relevant engineering problem.
2. Define a problem with modest complexity and develop appropriate design criteria and constraints.
3. Build on experience with the design cycle to create, develop and assess a design solution.
4. Select, apply, and recognize the limitations of various engineering design tools, including model simulation and sensitivity analysis.
5. Critically evaluate information from many sources including engineering journals, data processing, and engineering analysis, and disseminate design information in technical communications.
6. Recognize professional and ethical behaviour and perform accordingly.
7. Analyze the social, environmental, economic and legal impacts of engineered designs.
8. Apply project management techniques to allocate time and resources and meet project objectives.
9. Work effectively as a member and leader in a team.

#### 4.4 Graduate Attributes

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

<u>Graduate Attribute</u>	<u>Learning Objectives</u>	<u>Assessment</u>
1. Knowledge Base for Engineering	1, 4, 7, 8	Design Project
2. Problem Analysis	1 - 4	Design Project
3. Investigation	-	
4. Design	All	Design Project
5. Use of Engineering Tools	4	Design Project
6. Communication	5	Design Project
7. Individual and Teamwork	9	Design Project
8. Professionalism	6	Design Project
9. Impact of Eng. on Society and the Env.	7	Design Project
10. Ethics and Equity	6	Design Project
11. Project Management & Economics	7, 8	Design Project

#### 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.

#### 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 and academic forms can be found at: <https://www.uoguelph.ca/engineering/academic-procedures>.

#### 4.7 Expectations for Student Conduct

##### 4.7.1 Lecture

1. Attendance at lectures is important. Expectations for course assessments will be delivered to all students during lecture times to ensure that students in all sections receive the same information. Students are expected to demonstrate knowledge of the course material by incorporating it into the design process and products, as appropriate.
2. Show respect for instructors and guests by attending and engaging in lectures.
3. Participation in active learning exercises is strongly encouraged.
4. Everyone in the classroom has the right to participate and contribute. The learning environment must be free from harassment.

5. Be courteous to instructors, guests and classmates. Phones are to be turned off during the class, ear buds must be put away, and the use of laptops and tablets in class is restricted to taking notes.

#### 4.7.2 Design Labs and Group Work

1. Maintain **courteous relations** with all group members;
2. Maintain the **highest standards of integrity**, personal and professional conduct;
3. **Familiarize yourself with and abide** by the letter and spirit of all applicable documents, policies, rules and regulations;
4. Comply with **both the letter and spirit of the law** to design a functional, safe, durable, cost-effective, environmentally-friendly, and socially beneficial design.
5. You are expected to **attend all Lab sessions**. If you are unable to make one of your lab sessions due to extenuating circumstances, it is essential that you let the instructor know about your absence.
6. You are expected to **attend all group meetings**. If you are unable to make one of your group meetings, it is essential that you clearly communicate with every one of your group members.
7. **Distribute the workload** among team members as fairly as possible. Expectations for work quality and timing of deliverables must be communicated to and agreed upon by all group members.
8. It is expected that all **submitted work is original** or properly referenced.
9. Carefully **review any work** that is submitted by your group, even if it was completed by another group member (i.e. all group members are responsible for all work submitted by the group).

#### 4.8 Relationships with other Courses & Labs

##### Previous Courses:

**ENGG\*1100:** Design 1 – an emphasis on the design process

**ENGG\*2100:** Design 2 – an emphasis on computer tools

##### Follow-on Courses:

**ENGG\*41x0:** Capstone design course that brings all design and analysis together

## 5 TEACHING AND LEARNING ACTIVITIES

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### 5.1 Timetable

#### Lectures:

Tuesday	11:30 – 12:50	ROZH 101
Thursday	11:30 – 12:50	ROZH 101

#### Laboratory:

Monday	0105	14:30 – 16:20	THRN 1002, 1006, 1435
Tuesday	0101	13:30 – 15:20	THRN 1002, 1006, 1435
Tuesday	0102	15:30 – 17:20	THRN 1002, 1006, 1435
Wednesday	0103	14:30 – 16:20	THRN 1002, 1006, 1435
Thursday	0104	13:30 – 15:20	THRN 1002, 1006, 1435

### 5.2 Lecture Schedule

Week	Lecture Topics	Learning Objectives
1	Industry Project Ideas / Design Process and Competencies	2, 3
2	Industry Project Ideas / Problem Definition	2, 3
3	Generating Design Ideas / Accessing Resources	3, 5
4	Evaluating Design Solutions	3, 4, 7
5	Technical Report Writing / Due Diligence	5, 7
6	Project Management	8
7	Material Selection / Cost Analysis	8
8	Environmental Impact / Life Cycle Analysis	7
9	Socially Acceptable Design / Presentation Skills	7
10	Intellectual Property and Other Topics	
11	Design Project Presentations (Semi-finals)	
12	Graduate Studies and 41x	

### 5.3 Other Important Dates

Monday, January 8, 2018: First day of class

Monday, February 19 – Friday, February 23, 2018: Winter Break

Friday, March 9, 2018: 40th class day, last day to drop courses

Friday, April 6, 2018: last day of classes



## 6 LAB SAFETY

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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.

If the laboratory rules are not followed, consequences will include removing student's access to the lab. If this results in lab work not being completed, the student will receive a grade of 0.

## 7 ACADEMIC MISCONDUCT

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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.

Please take note of the Acceptable Use Policy of University of Guelph for Information Technology:

<https://www.uoguelph.ca/cio/content/aup-acceptable-use-policy>

### 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/>

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

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

### 7.2 Turnitin

Accounts are available to students on Turnitin to help with the editing of their submissions to ensure that plagiarism does not take place. Students should be aware that Turnitin will be enabled on dropbox submission in this course.

## 8 ACCESSIBILITY

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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 Student Accessibility Services at [519-824-4120](tel:519-824-4120) ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or see the website: <http://www.uoguelph.ca/csd/>

## 9 RECORDING OF MATERIALS

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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

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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>