

# MECH ENG 2C04 – Engineering Design I

Instructor: Dr. Elizabeth Hassan

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**Lecture:** Tuesday 1730 JHE 264

Thursday 1730 JHE 264

**Lab: Starting January 13**

Section	Time	TA	Contact
L01			
L02			
L03			
L04			
L05			
L06			

**Office hours:** TBD ETB 109 (Dr. Hassan's office)

## Communication Guidelines:

- Please do not leave voicemails
- Email will be replied to within 24h, but please include the course code (2C04) in the subject line
- You can instant message Dr. Hassan on Slack, your Mac ID should allow you to join the 2c04design.slack team (team name "2c04design"),
- If you need to see Dr. Hassan in person, you can come to open office hours or book at appointment via email

## Equipment/Text:

- **There is no textbook for this course**, my notes should be sufficient, posted on Avenue.

- **Lockers:** Can be obtained from Lily in the main office for a deposit, more details will follow later in the term.
- **Kits:** Can be obtained from Lily in the main office for a deposit, more details will follow later in the term.

## Course policies:

- **Attendance at lab sessions is mandatory** so that you can meet with your project TA, a portion of your course grade is for lab attendance
- There will be some times when you will work with others in the class, but your assignments are handed in as individual deliverables, the simulation and the final project is handed in as a group.
- You can hand in assignments up to **one week late** with no penalty. If due to illness, you require more time than the **one-week** grace period due for your submissions, contact Dr. Hassan.
- Rubric feedback will be posted on Avenue, if after reviewing the guide you think that your assignment has a grading error, send Dr. Hassan an email.
- Course materials will be posted on Avenue. Please check your McMaster email for updates
- All submissions must be digital, pdf format via Avenue. **Make sure that photos, scans or pdfs of your drawings are legible** so the TAs can grade them
- Participation in lecture will be assessed by in-class quizzes using avenue. At the end of the term this overall score will be converted to a % grade using the scale below (where  $x$  is total possible points per term):

If total points =	0	0.2x	0.4x	0.6x	> 0.8x
% grade (out of 15)	0	1.5	3	4.5	6

- The purpose of this scale to reward consistent participation. Even if you are not always correct, you can achieve a high participation grade (since “perfect” is actually 80%)

## About the project:

- **THE RULES ARE DIFFERENT FROM LAST YEAR'S CLASS. READ ALL DOCUMENTATION CAREFULLY.**
- A full rules document will be posted on Avenue.
- The project is done in **groups of 4**. You may choose your own groups, but you must all be in the same lab section. You may switch lab sections, but you must do so on Mosaic to ensure that there is room.
- Your task is to build a robot to complete the specified task using the kit and materials budget provided.
- You must return the kit **intact**. Do not glue, paint or otherwise permanently alter any part of the kit.
- You will have access to the competition course after the reading week.
- Parts can be submitted to the Parts TA via email. Although we will try to respond as quickly as possible; there is no guarantee of prompt service, particularly at the end of term. Submit your parts well in advance to avoid problems.
- You are welcome to use parts you manufacture or purchase from other sources (e.g. MakerSpace, home), however **you may only use the provided motors and power supply**. Use of additional motors or power supplies will result in a grade of 0 on your prototype testing.

## Course Grade Breakdown:

	<i>Due</i>	<i>Value</i>
<b>Individual Deliverables</b>		
Lab attendance	Weekly	3 %
In class quizzes	Throughout the term	6 %
Individual Assignments	Submit pdf on avenue	28 %
Peer Evaluation via ITPmetrics	Weeks of 4 february, 4 march, 1 april	3 %
<b>Group Deliverables</b>		
Weekly lab progress report	Weekly after lab	5 %
Group Simulation Assignment	Mid February	7 %
Design review	Early February	10 %
Final project prototype testing	3 weeks in lab	15 %

Final project report	Submit pdf on avenue by last day of class	23 %
<b>Total</b>		<b>100 %</b>

## Assignments:

- Each worth 7%.
- Handed in individually as pdf via avenue
- Assignment specification and rubric can be found in the avenue dropbox
- Due at 5pm on Friday on due date, plus a **one week** grace period.

#	Assignment	Due
1	Individual Concept Generation	mid january
2	Concept selection	early february
3	Redesign case study	early march
4	DFMA case study	late march

## Learning Outcomes:

By the end of the MECHENG 2C04, the student should be able to:

1. Work as an effective team member on a mechanical design project.
2. Generate multiple design alternatives.
3. Select an initial design solution.
4. Analyze and evaluate the design solution using a CAD generated model.
5. Prepare an invoice based on the contribution of the team members and material costs.
6. Construct a written design project report with engineering and manufacturing drawings.
7. Use CAD to generate data for manufacturing components using a 3D printer and laser cutter.
8. Present their design solution to an audience.

## Graduate Attributes:

MECHENG 2C04 provides the student the opportunity to develop competence in the following CEAB graduate attributes:

<b>Graduate Attributes</b>	<b>Deliverable</b>
<i>A1 – A Knowledge Base for Engineering</i>	
1.03 - Competence in Engineering Fundamentals	Quizzes Prototype function
1.04 - Competence in Specialized Engineering Knowledge	Quizzes Design review Simulation Assignment 4
<i>A04 - Design</i>	
4.04 - Employs appropriate techniques for generation of creative ideas such as brainstorming and structured inventive thinking	Assignment 1 Assignment 2
<i>A05 – Use of Engineering Tools</i>	
5.01 - Evaluates and selects appropriate modern tools.	Quizzes Design review Simulation
<i>A11 – Economics and Project Management</i>	
11.2 - Plans and effectively manages time, resources, and scope.	Assignment 4 Final report

## **Policy Reminders**

Senate and Faculty of Engineering require all course outlines to include the following reminders:

“The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem, that cannot be solved by discussion among the persons concerned, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.”

“Students are reminded that they should read and comply with the Statement on Academic Ethics and the Senate Resolution on Academic Dishonesty as found in the Senate Policy Statements distributed at registration and available in the Senate Office.”

"Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university”.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty, please refer to the Academic Integrity Policy of McMaster located at

<http://www.mcmaster.ca/academicintegrity/students/index.html>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g., the submission of work that is not one's own or for which other credit has been obtained.
2. Not participating fairly in the group project work.
3. Copying or using unauthorized aids in tests and examinations.

### **MSAF Policy**

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

[http://academiccalendars.romcmaster.ca/content.php?catoid=18&navoid=3204#Requests\\_for\\_Relief\\_for\\_Missed\\_Academic\\_Term\\_Work](http://academiccalendars.romcmaster.ca/content.php?catoid=18&navoid=3204#Requests_for_Relief_for_Missed_Academic_Term_Work)

If a student submits an MSAF, the assignment will be due electronically on Avenue up to two weeks later with no penalty.