ENGG*2100 Engineering & Design II
Fall 2013

UNIVERSITY of GUELPH

School of Engineering

(Revision 0: September 5, 2013)

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1 INSTRUCTIONAL SUPPORT

1.1 Instructor

Instructor:	John Runciman, Ph.D., P.Eng.
Office:	THRN 1344, ext. 53072
Email:	jruncima@uoguelph.ca
Office hours:	By appointment

1.2 Lab Technician

Technicians:	Dave Wright	Ken Graham
Office:	THRN 1019, ext. 56706	THRN 1021, ext. 53924
Email:	dwrigh02@uoguelph.ca	kgraha06@uoguelph.ca

1.3 Teaching Assistants

GTA	Email	Office Hours
Gregor Scott	gscott@uoguelph.ca	Please use lab hours
Ning Pan	pann@uoguelph.ca	Please use lab hours
Robert Littel	rlittel@uoguelph.ca	Please use lab hours
Xiaoyan Chen	xchen03@uoguelph.ca	Please use lab hours

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the ENGG*2100 Courselink site. You are responsible for checking the site regularly.

2.2 Required Resources: Not Applicable

2.3 Recommended Resources: Not Applicable

2.4 Other Resources

Lecture Information: Lecture notes will not be posted on the web page.

Lab Information: Teaching Assistants will be available in lab periods to direct activities and answer questions. The Teaching Assistants will provide resources regarding tutorials and links to related web pages.

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 course website. It is your responsibility to check the course website regularly. As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its student.

3 ASSESSMENT

3.1 Distribution and Dates

Seminars:

Presentation without the use of aids, scheduled in the first half of the course,	6%
Presentation with the use of aids, scheduled in the second half of the course,	8%

Labs: (please see 5.3 Lab Schedule for date information)

Reverse engineering exercise, scheduled in the first half of the course,

- skills master checks	6%
- component drawings	10%
- animation	8%

Design and Build project, scheduled in the second half of the course,

- concept sketches	2%

- design proposal	6%
- group presentation	6%
- demonstration	6%
- design evaluation	7%
- final report	15%

Final Exam:

December 10, 08:30-10:30, Room TBA on Webadvisor 20%

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 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

Passing grade: In order to pass the course, you must pass both the Design & Build component of the laboratory and the Final Exam components. A failing grade (50% or lower) on the Design and Build portion OR on the Final Exam will mean that you have failed the course. The assigned grade will be based on the failed items only. If a student passes both the Design & Build and Final Exam components of the course, their final mark will be the average of all course components, and a grade of 50% is considered a passing grade.

Late Submissions will not be accepted.

Grading Philosophy: The grading philosophy used for this course will recognize that design has a significant artistic component and is not a right or wrong situation. Thus, we will start with a perspective that your work is assumed to be a "B" until there is evidence within that work that is impressive or aspects that are disappointing. Impressive and disappointing components are integrated to leave a final assessment. Letter grades are used to reflect that the process is not ±2% accurate and that design could never be assessed with fine resolution.

Letter grade translation:

A+	Really Impressive	100
A	Impressive	90
A-		82
B+		78
B	Expected	75
B-		72

C+		68
C	Satisfactory	65
C-		62
D+		58
D	Disappointing, serious flaws	55
D-		52
F	Inadequate	35
X	no submission or wholly inadequate	0

The Design and Build Project: This project forms a major activity in the course. Teams will be asked to evaluate individual team member participation. Evidence of lack of participation by individuals will result in a modified grade assessment for those students.

Final Exam: The Final Exam will be used to assess your understanding of the lecture material. The Final Exam will be closed book with no electronic aids permitted.

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4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

4.1 Calendar Description

Progression in engineering design skills with particular emphasis on computer usage in design, on oral communication of solutions and team skills. Computer usage in design will include advanced CAD/CAM/CAE tools, structured programming and database management software. An introduction to safety in engineering practice and design. An introduction to the concept of sustainable development.

Prerequisite(s): ENGG*1100 plus 4.0 credits

(It is expected that students will have completed the majority of the first year courses and be taking the majority of the semester 3 courses for their engineering program).

Credit Weighting: 0.75

This means an average student requires about 15 hours per week to get a 'B' grade. This 15 hours includes the 6 hours of scheduled class time (2 hrs lecture, 3 hrs lab & 1 hr seminar) per week.

4.2 Course Aims

This is the second course in the undergraduate engineering design sequence. The main goals of the courses are to provide experience and guidance for working in and leading teams, developing communication and presentation skills, and teaching design using 3-D modelling techniques. Students in this course will work in teams to reverse engineer a common object such as a lawn mower, and then use skills learned in this project to then conceive, design, build, test and present a unique solution to a complex design problem.

4.3 Learning Objectives

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

1. Present orally with and without aids
2. Work within a team to reverse engineer a complex structure
3. Work within a team to solve a complex problem
4. Conceptualize physical solutions to a complex problem
5. Develop, design. build, test and demonstrate a novel design solution for a complex problem
6. Generate an engineering design report
7. Identify various manufacturing strategies and their characteristics.
8. Evaluate safety issues related to design.
9. Discuss issues related to sustainability and ethics as they relate to design.

4.4 Graduate Attributes

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

Graduate Attribute	Assessment
1. Knowledge Base for Engineering	-
2. Problem Analysis	Exam and Labs
3. Investigation	Labs
4. Design	Labs
5. Use of Engineering Tools	Labs, Exam
6. Communication	Labs, Seminars
7. Individual and Teamwork	Labs
8. Professionalism	Exam and Labs
9. Impact of Engineering on Society and the Environment	Exam
10. Ethics and Equity	Exam and Labs
11. Environment, Society, Business, & Project Management	Labs
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 present relevant material including case studies, discuss issues relevant to design and provide information and guidance on issues of communication, teamwork and design. Scheduled classes will be the principal venue to provide information and feedback for the course. Feedback for Seminar presentations and lab work will be through those venues.

4.6 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures, seminars and labs. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor and Teaching Assistants. 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.

4.7 Relationships with other Courses & Labs

Previous Courses:

ENGG*1100: Design fundamentals and concept development

Follow-on Courses:

ENGG*3100: Project based design, field specific design, external / industrial applications

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5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable

LECTURES: ROZH 103 T & TH 8:30 – 9:20

LABS: You MUST attend your assigned section only. Lab Attendance is expected for all weeks.

All of the following rooms THRN 1004, SHOP (THRN 1025) & THRN 1006 will be used for the lab component of this course. Lab times by Section are as follows:

1.1, 1.2, 1.3 & 1.4	Tuesday	11:30 – 2:20
2.1, 2.2, 2.3 & 2.4	Thursday	11:30 – 2:20
3.1, 3.2, 3.3 & 3.4	Friday	11:30 – 2:20
4 .1, 4.2, 4.3 & 4.4	Friday	2:30 – 5:20

SEMINARS: Seminars will be used for personal presentations. Seminar times by Section are as follows:

1.1, 2.1, 3.1 & 4.1	MACK 228	Monday	1:30 – 2:20
1.2, 2.2, 3.2 & 4.2	THRN 1307	Monday	4:30 – 5:20
1.3, 2.3, 3.3 & 4.3	ALEX 259	Wednesday	12:30 – 1:20
1.4, 2.4, 3.4 & 4.4	MACK 235	Wednesday	3:30 – 4:20
EXAM:	Location: TBD	Dec. 10, 2013	8:30 – 10:30

5.2 **Lecture Schedule** (Subject to change at the discretion of the instructor)

Lectures	**Lecture Topics**	**Learning Objectives**
1	Introduction to Course, lab safety and Seminar Administration	1
2	Design and Engineering	4
3	"Total Design"	4
4	Tools of Engineering Design	4
5	Teamwork - basics	2 & 3
6	Teamwork – strategies for dealing with people	2 & 3
7	Teamwork – group dynamics	2 & 3
8	Meetings	2 & 3
9	Meeting – chairing	2 & 3
10	Brainstorming	3 & 4
11	Brainstorming – by design	3 & 4
12	Creative Design, Concept Development	4
13	Creative Design, Case Studies	4
14	Design Ergonomics – communicating through your design	4 & 8
15	Design Ergonomics – case studies	4 & 8
16	Manufacturing	7
17	Polymer Manufacturing	7
18	Quality Assurance	7
19	International, National and Local Standards and Guidelines	8 & 9
20	Sustainability and Ethics	8 & 9
21	Safety	8 & 9
21 - 23	Guest lectures, TBA	
24	Review	

5.3 Lab Schedule

Week	Shop Activity	Shop Deliverables	COMPUTER LAB ACTIVITY (THRN 1004)	Computer Lab Deliverables
1	**Reverse Engineering** - team creation - component distribution **Attendance Mandatory**	Team Data	3-D Modelling Basic Skills -1 **Attendance Mandatory**	
2	**Reverse Engineering** - disassembly	**Reverse Engineering** components assigned	3-D Modelling Basic Skills -2	Basic skills -1, mastery check
3	**Reverse Engineering** - materials & manufacturing		3-D Modelling & 2-D drawings	Basic skills -2, mastery check
4	**Reverse Engineering** - finalize details		3-D Modelling	Basic skills - 2-D drawings, mastery check
5	**Design & Build Project** - brainstorming		3-D Modelling - Animations	
6	**Design & Build Project** - brainstorming		3-D Modelling	**Reverse Engineering** component drawings due
7	**Design & Build Project** - design	**Design & Build Project** concept sketches due	**Design & Build Project** - design	**Reverse Engineering** animations due
8	**Design & Build Project** - early bird printer access		**Design & Build Project** - coaching	**Design & Build Project** Design Proposal due
9	**Design & Build Project** - build			
10	**Design & Build Project** - build		**Design & Build Project** Presentation & Report coaching	
11	**Design & Build Project** - build		**Design & Build Project** - final report preparation - presentation coaching	
12	**Design & Build Project**	- group presentations - demonstration - design evaluation - final report submission		

5.4 Seminar Schedule

Week	Topic	
1	Individual presentations	(without aids)
2	Individual presentations	(without aids)
3	Individual presentations	(without aids)
4	Individual presentations	(without aids)
5	Individual presentations	(without aids)
6	Individual presentations	(without aids)

7	Individual presentations	(with aids)
8	Individual presentations	(with aids)
9	Individual presentations	(with aids)
10	Individual presentations	(with aids)
11	Individual presentations	(with aids)
12	Individual presentations	(with aids)

5.5 Other Important Dates: See your program guide for specifics.

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6 LAB SAFETY

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.

Laboratory / Machine Shop Safety: Many laboratory sessions will be held in the School's machine shop. The following safety principles apply to all sessions and to all students:

1. Ken Graham and Dave Wright have full authority for all aspects of our time in the shop
2. There will be a maximum of 25 students in the shop at any point in time and this number can only be supported when both Ken or Dave and a GTA are present
3. You will NOT be able to attend any lab session other than the one assigned to your lab section of the course
4. You will be required to show respect for Ken, Dave, your GTA and the shop's equipment
5. You will be required to dress appropriately
6. No open toed shoes
7. No lose clothing
8. Safety glasses are to be worn
9. Shop coats are to be worn
10. If you do not know how to use shop equipment - ASK.
11. THINK first.
12. Additional rules will be posted in the shop or expressed by Ken or Dave.
13. Failure to safely work in the shop may lead to lost shop privileges. This is likely to have academic consequences.

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.

Academic Conduct Expectations and Academic Misconduct: The course requires several team written submissions. All team members must sign the cover sheet for the submissions. This cover sheet must also have the following statement.

In signing this cover page, I certify that I have been an active member of the team and provided approximately equal contribution to the work. I understand that taking credit for work that is not my own is a form of academic misconduct and will be treated as such.

Respect for ownership of Intellectual Property (e.g. copyright, patents, trade marks, music, software) is important. Work that has been created or prepared with unlicensed or illegal software will not be knowingly accepted for submission within the course (e.g. a grade of zero will be assigned).

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

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/