ENGG*4000 Proposal for Engineering Design IV

01

Fall 2022
Section(s): C01

School of Engineering
Credit Weight: 0.00
Version 1.00 - September 08, 2022

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1 Course Details

1.1 Calendar Description

In this course students will prepare a proposal for the design project that will be completed in the Engineering Design IV course in their program of study. Teams normally of 3 to 4 students (single student groups not allowed) will prepare the proposal, providing details on the proposed project, identify the group's members and identify the faculty adviser, who has a P.Eng.. Students are responsible for creating their own design group and securing a faculty advisor.

Pre-Requisites:	ENGG*3100
Restrictions:	Registration in the semester preceding the last semester of the BENG Program. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

1.2 Course Description

This course will prepare students to deal with open-ended, multi-faceted design problems, similar to those that they will encounter as working professionals. To that end, each student will apply the knowledge they have learned in their discipline-specific courses in the design environment.

Teams of normally 3 to 4 students will apply their academic knowledge to the identification of a specific engineering problem that they will solve in the subsequent Engineering Design IV course in their program of study (ENGG*4110, ENGG*4120, ENGG*4130, ENGG*4150, ENGG*4160, ENGG*4170 and ENGG*4180). The team will prepare the proposal, providing

details on the proposed project, identify the group members and identify the faculty advisor.

Students are responsible for creating their own design group and securing a faculty advisor. Faculty Advisors must be licensed Professional Engineers (P.Eng.). See the SOE Faculty webpage for listings.

https://www.uoguelph.ca/engineering/people?field_profile_role_tid=21

Smaller (or larger) groups are only considered by the course coordinator/instructor under extraordinary circumstances, and approval is conditional on the availability of sufficient resources and suitability of the project. Inter-disciplinary groups are encouraged if a particular problem has sufficient scope to provide appropriate experience to all team members. CourseLink maintains a discussion thread that the students can use to help with arranging group members.

1.3 Timetable

There are no formal lectures or tutorials. Students are self-directed in preparing the proposal and capstone application package.

Two optional class meetings will be organized during the semester (either online or in person) for introductions and to allow for questions and answers regarding the course and expectations. Meeting times and format will be announced on CourseLink.

1.4 Final Exam

There is no final exam for this course.

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2 Instructional Support

2.1 Instructional Support Team

Instructor:	Kim Thompson P.Eng.
Email:	kithomps@uoguelph.ca
Telephone:	+1-519-824-4120 x56986
Office:	THRN 1410
Office Hours:	Please send an email to the instructor for a meeting appointment.

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3 Learning Resources

3.1 Required Resources

CourseLink (Website)
https://courselink.uoguelph.ca

Course material, news, announcements, and grades will be regularly posted to the ENGG*4000 CourseLink site. Students are responsible for checking the site regularly.

The instructor/course coordinator will also communicate with the students through their <uoguelph.ca> e-mail account. 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 students.

3.2 Additional Resources

SOE Capstone Website (Website)
Students are encouraged to make use of SOE Capstone website. The website will be used for various purposes including but not limited to building project teams, selecting projects and faculty advisors, and submitting information for the Engineering Design Day.

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4 Learning Outcomes

ENGG*4000 is a zero-credit course that prepares the student for the 1.0 credit capstone course (ENGG*41x0) that will be taken in the student's final semester. As such, students are required to build on the knowledge gained in all the preceding courses, applying engineering analysis and design principles to develop the proposal. This includes assessment of socio-economic, environmental impact and public safety.

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Apply academic knowledge to identify a complex engineering problem in a project proposal.
2. Participate in and further develop group interaction skills.

4.2 Engineers Canada - Graduate Attributes (2018)

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

Graduate Attribute		Learning Outcome
4	Design	1, 2
4.1	Describe design process used to develop design solution	1, 2
4.2	Construct design-specific problem statements including the definition of criteria and constraints	1, 2
4.3	Create a variety of engineering design solutions	1, 2
4.4	Evaluate alternative design solutions based on problem definition	1, 2
5	Use of Engineering Tools	1, 2
5.1	Select appropriate engineering tools from various alternatives	1, 2
6	Individual & Teamwork	1, 2
6.1	Describe principles of team dynamics and leadership	1, 2
6.2	Understand all members' roles and responsibilities within a team	1, 2
6.3	Execute and adapt individual role to promote team success through, for example, timeliness, respect, positive attitude	1, 2
6.4	Apply strategies to mitigate and/or resolve conflicts	1, 2
6.5	Demonstrate leadership through, for example, influencing team vision and process, promoting a positive team culture, and inspiring team members to excel	1, 2
7	Communication Skills	1, 2

7.1	Identify key message(s) and intended audience in verbal or written communication as both sender and receiver	1, 2
7.2	Interpret technical documentation such as device specification sheets, drawings, diagrams, flowcharts, and pseudocode	1, 2
7.3	Construct the finished elements using accepted norms in English, graphical standards, and engineering conventions, as appropriate for the message and audience	1, 2
7.4	Substantiate claims by building evidence-based arguments and integrating effective figures, tables, equations, and/or references	1, 2
7.5	Demonstrate ability to process oral and written communication by following instructions, actively listening, incorporating feedback, and formulating meaningful questions	1, 2
11	Economics and Project Management	1, 2
11.1	Apply project management techniques and manage resources within identified constraints	1, 2
11.2	Identify risk and change management techniques, in the context of effective project management	1, 2
11.3	Estimate economic impact and feasibility of an engineering project or design using techniques such as cost benefit analysis over the life of the project or design	1, 2

5 Teaching and Learning Activities

There are no formal lectures, labs or tutorials for this course. Students are self-directed in preparing the proposal.

5.1 Student Design Activities and Milestones

Weeks 1 – 3

Students actively communicate with classmates and faculty to form design groups and to confirm a faculty advisor.

Students are encouraged to use the SOE Capstone Website and CourseLink to discuss ideas with other students and to seek out project ideas.

Faculty Advisors must be licensed Professional Engineers (P.Eng.). See the SOE Faculty Webpage for listings.

https://www.uoguelph.ca/engineering/people?field_profile_role_tid=21

Due Date: Friday, Sept. 30, 2022, 1700hr (5:00 PM)

Submit design group member names and project faculty advisor name no later than 1700hr (5:00 PM) on September 30, 2022.

(Submit as a group).

Students have the option to provide this information on the SOE Capstone Website (and/or) to submit in an email to the course coordinator/instructor at kithomps@uoguelph.ca

Weeks 4 – 8

Each design group works together as a team to prepare a proposal in accordance with the Rubric located on the CourseLink site.

Students are encouraged to meet regularly with their project faculty advisor for feedback.

Due Date: Friday, Nov. 4, 2022, 1700hr (5:00 PM)

	Submit project proposal to Dropbox in CourseLink no later than Friday November 4, 2022 at 1700hr (5:00 PM). **(Submit as a group)**.
Weeks 8 – 12	**If necessary**, prepare an Research Ethics Board (REB) package for the ENGG*41x0 portion of the project. Students must consult with the Project Faculty Advisor and the CourseLink site for additional information.
	Due Date: Friday, Dec. 2, 2022, 1700hr (5:00 PM) Submit REB package to the Project Faculty Advisor no later than Friday, December 2, 2022 at 1700hr (5:00 PM) **(Submit as a group)**

For the purpose of this schedule of dates, Week 1 begins on September 12, 2022.

5.2 Other Important Dates

1. First day of classes: Sept. 8, 2022
2. Holidays: Oct. 10 (Thanksgiving) & 11 (Fall Study Break Day), 2022
3. Last day of classes: Dec. 2, 2022

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6 Assessments

Group and Advisor Submission	P/F	Sept. 30, 2022
Proposal	P/F	Nov. 4, 2022
REB Draft Submission (if required)		Dec. 2, 2022

6.1 Assessment Details

Group and Advisor Submission (0%)

Due: Fri, Sep 30, 5:00 PM, SOE Capstone Website (and/or) email: kithomps@uoguelph.ca
Learning Outcome: 2
Details about the SOE Capstone Website will be provided on CourseLink

Proposal (100%)
Due: Fri, Nov 4, 5:00 PM, CourseLink Dropbox
Learning Outcome: 1, 2

6.2 Group and Advisor Submission

It is important for students to form project design groups early so that there is sufficient time to develop a quality proposal and receive feedback from their Project Faculty Advisor prior to final submission. Students who have not yet joined a design group by the Group and Advisor submission deadline will be contacted with options for continued registration in the course.

6.3 Proposal

The goal of the course is for students to prepare a proposal that deals with open-ended, multi-faceted design problems similar to those they will encounter as working professionals and solve in their final semester in ENGG*41x0. The proposal is a written offer to perform a specific design, that has the following characteristics:

- specific type of engineering proposal/report with its associated common elements (i.e., layout, front material, subject groupings, etc.)
- use a positive, optimistic tone (persuasive without being misleading) that is more familiar than usual in scientific reports (e.g., can be written in 1st person active voice rather than 3rd person passive)
- must be brief and to the point (5-8 pages of body text, not including appendices)
- written so the reader gets the main ideas of the proposed work but not all the technical details
- must clearly highlight benefits and costs (drawbacks) and other impacts as identified by the Rubric on CourseLink
- Identifies:
    - **what:** statement of need, problem definition, design ideas
    - **why:** point out benefits to client (monetary profit, social need, a perceived operational problem, system improvement, etc.)
    - **how:** personnel involved, resources required (budget, facilities, equipment, personnel), action plan, methodology
    - **when:** plan of project with timeline (brief in proposal), deliverables and due dates
    - **names** of all group members
    - **name of faculty advisor** who has the P.Eng. designation

Proposals are submitted as a group and will be graded Pass/Fail according to the Rubric posted on CourseLink. Proposals graded as Fail, can be resubmitted to obtain a Pass prior to the start of ENGG*41x0.

Signature Page: Each student must provide their name and signature on the signature page of the proposal/report to indicate they have read and contributed approximately equally to the preparation of the proposal/report (See the Signature Page Template provided on CourseLink).

Upon submission of the proposal, groups are encouraged to also update the Overview section for their proposal on the Capstone Project website. This information helps the School of Engineering administer ENGG*4000 and ENGG*41x0.

6.4 Research Ethics Board (REB) Approvals

Groups may require approval from the Research Ethics Board (REB) as part of their planned project work in ENGG*41x0. Approval is required for research that involves contact with human and/or animal subjects, their tissue and/or data about them (this could include the designers themselves… You count as human, so if you test a prototype on yourself, you have a human participant).

If any of the following statements apply to your project, you may need REB approval: During the design, development, testing, and/or demonstration (Engineering Design Day):

1. The project will be placed on or in a human/animal. (e.g., medical sensors, VR headset, etc.)

2. A human/animal be placed on or in my project. (e.g., training device, assistive device, etc.)

3. The project will capture and retain data about a human/animal. (e.g., video, survey, cellphone MAC address, etc.)

If the work outlined in the proposal submission is identified as meeting these criteria, the group will be notified, and a draft of the REB application form must be completed and submitted to the project Faculty Advisor by the last day of class, as published in the Undergraduate Calendar Schedule of Dates. In the event that the draft is not completed by this deadline, the group will have to determine an alternate project, and may receive a fail for

the proposal if the project proposed is no longer feasible. For more information on the approval process, see https://www.uoguelph.ca/research/services-divisions/ethics/approval-process.

6.5 Course Grading Policies

Passing grade: In order to pass the course, students must obtain a Pass in all course components. Failure to do so will result in a student being departmentally dropped from ENGG*41x0. In the event that a student fails a course or courses taken concurrently with ENGG*4000, and those failures affect eligibility to take ENGG*41x0, the student will be removed from the ENGG*41X0 course and ENGG*4000 will also be removed from the student's record so that the student can register for ENGG*4000 in the next offering of the course.

Signature Page: Each student must provide their name and signature on the signature page of the proposal/report to indicate they have read and contributed approximately equally to the preparation of the proposal/report (See the Signature Page Template provided on CourseLink).

6.6 Course Format

This is an on-line course that has no scheduled meeting times. Students are required to arrange their own groups, ideally 3 to 4 students in size, with no solo projects allowed. Smaller (or larger) groups are only considered by the course coordinator under extraordinary circumstances, and approval is conditional on availability of sufficient resources and suitability of project. Inter-disciplinary groups are encouraged if a particular problem has sufficient scope to provide appropriate experience to all team members. CourseLink maintains a discussion thread that the students can use to help with arranging group members.

6.7 Registration for 41x0

Students registered in F22 ENGG*4000 must select ENGG*41x0 using Student Planning during the upcoming course selection period for W23. Eligibility to remain registered in ENGG*41x0 is dependent on meeting all of the conditions listed on the Registration Request for ENGG*4000 form, located on the SOE website.

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7 Course Statements

7.1 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website [hyperlink to the website] and circulated by email.

8 School of Engineering Statements

8.1 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 but these are not intended to be stand-alone course notes. Some written lecture notes will be presented only in class. 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 labs.

8.2 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and lab sessions. 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.

8.3 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.

9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

9.3 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

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml

Associate Diploma Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml

9.4 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.

9.5 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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a

week ahead of time.

For Guelph students, information can be found on the SAS website
https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website
https://www.ridgetownc.com/services/accessibilityservices.cfm

9.6 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

Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

9.7 Recording of Materials

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

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars

9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

9.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
