



Course Outline

Instruction Team

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Student Hours

- Dr. Levin: Please e-mail Dr. Levin to make an appointment.
- Ms. Morris: Please e-mail to schedule appointment.

Location

- **E2-310**
T 2:30-5:15 PM (as req'd)

Contact Hours

- 3 credit hours
- Lectures:
3 hours x 13 weeks = 39 hours

Prerequisites:

- BIOE 3270

Course Website:

<http://umanitoba.ca/umlearn>

Traditional Territories Acknowledgement

The University of Manitoba campuses are located on the original lands of the Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Métis Nation.

We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.

BIOE 4240 Graduation Project

Winter 2024

Course Objectives

There are many instances when an engineer will be faced with a situation when an informed decision cannot be made until sufficient information is provided. In such situations, there is a need to obtain information through means such as experimental study or a comprehensive review of the published literature. A practicing engineer will use these skills to maintain professional competence and to contribute to the advancement of the engineering knowledge. During this course, students will gain the experience of managing and completing an independent project. Communication skills will be developed through a preparation of a written project report and a formal presentation of project findings.

Course Content

This course aims to give students an opportunity to be solely responsible for completion of a term-long engineering project. This course will introduce students to the types of research relevant to the disciplines of Biosystems Engineering. By providing students with the opportunity to independently manage their project, students will develop the confidence to undertake lifelong learning activities intended to generate the information needed to make informed decisions.

The following topics will be covered:

- Course Introduction
- Forms of scientific misconduct, plagiarism
- Scientific writing – organization, abstracting, referencing style, introduction, objectives
- Literature review, Materials & Methods, and How to make sense of your results
- How to effectively display your results, graphs and tables
- How to write effective conclusions
- Updates on progress of the projects. Input from the students.
- Making an effective oral presentation
- Individual updates on progress of the projects
- Updates on individual projects. Input from the students.

Textbook

None. Students are expected to follow the Canadian Biosystems Engineering journal referencing style when citing references in course assignments. The Instructions for preparing a paper for Canadian Biosystems Engineering is available through UM Learn. Please refer to this guide to ensure that you follow the correct referencing style.

Assignments

The marks and grade for this course are based on six (6) Assignments: Assignment 1) The Research Proposal (5 points); Assignment 2) an Annotated Bibliography (5 points); Assignment 3) an oral presentation of your thesis proposal in the form of a Three Minute Thesis (5 points); Assignment 4) a written report on your project Introduction and Methods (5 points); Assignment 5) The final written Thesis Report (50 points); and Assignment 6) an oral presentation of your Thesis Report (20 points). Your Thesis Supervisor will also provide an evaluation of your research activities (10 points).

Accreditation Details

- Mathematics: 0%
- Natural Science: 0%
- Complementary Studies: 25%
- Engineering Science: 0%
- Engineering Design: 75%

Graduate Attributes

KB: A knowledge base for engineering

PA: Problem analysis

IN: Investigation

DE: Design

ET: Use of engineering tools

IT: Individual and team work

CS: Communication skills

PR: Professionalism

IE: Impact of engineering on society/environment

EE: Ethics and equity

EP: Economics and project management

LL: Life-long learning

Competency Levels

- 1 - Knowledge (Able to recall information)
- 2 - Comprehension (Ability to rephrase information)
- 3 - Application (Ability to apply knowledge in a new situation)
- 4 - Analysis (Able to break problem into its components and establish relationships.)
- 5 - Synthesis (Able to combine separate elements into a whole)
- 6 - Evaluation (Able to judge the worth of something)

Grading Scale

guide for the instructor and class alike. Provided that no individual student is disadvantaged, the instructor may vary any of these boundaries to ensure consistency of grading from year-to-year.

Letter	Mark
A+	95-100
A	86-94
B+	80-85
B	73-79
C+	65-72
C	60-64
D	50-59
F	< 50

Learning Outcomes

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

No.	Learning Outcome	Transferable Skill
1	critically evaluate scientific publications using a formant of an annotated bibliography	Lifelong Learning
2	propose and execute a plan to investigate an engineering problem	Use of engineering tools, ethics and equity, lifelong learning, Individual work
3	compile a written report and compose an oral presentation.	Investigation, communication skills

Expected Competency Levels

Outcome	KB	PA	IN	DE	ET	IT	CS	PR	IE	EE	EP	LL
1												5
2						5				5		5
3			5				5					

CEAB Graduate Attributes Assessed

LL.1 Recognizes limitations of their knowledge and engages in actions to address them

LL.2 Critically reflects on successes, challenges and mistakes to guide ongoing learning

LL.3 Demonstrates research and information literacy skills

CS.1 Designs and produces effective written and graphical engineering documents for specific audiences (e.g., research reports, engineering reports, design documents)

CS.2 Designs, produces, and delivers effective technical presentations for specific audiences

IN.1 Gathers information and analyzes data

IN.2 Devises and implements an appropriate plan/methodology for gathering information required to solve an engineering problem

IN.3 Designs and produces appropriate engineering documents

ET.1A Uses analytical tools to complete engineering activities

ET.2 Evaluates and selects or creates appropriate tools for a given scenario

EE.3 Articulates one's own role in promoting ethics and equity

Important Dates

- **Early Withdrawal Deadline**
January 19, 2024
- **Louis Riel Day**
Feb. 19, 2024
No classes or examinations
- **Winter Term Break**
Feb. 19 – 23, 2024
No classes or examinations
- **Voluntary Withdrawal Deadline**
March 20, 2024
- **Good Friday**
March 29, 2024
No classes or examinations
- **Last Day of Classes**
April 10, 2024

Evaluation

Component	Value (%)	Assessor	Method of Feedback*	Learning Outcomes Evaluated	I/T**
Research Proposal: Due Feb. 1	5	DL/EM	S	1	I
Annotated Bibliography: Due Feb. 15	5	DL/EM	F, S	1, 2, 3, 4, 5, 6	I
3MT Presentation: Due Feb. 27	5	DL/EM	F, S	3, 5	I
Introduction/Methods Draft: Due March 21	5	DL/EM	F, S	1, 5	I
Oral Presentation: April 11	20	Dept.	F, S	3, 5	I
Written Report: Due April 11	50	DL, EM, PI	F, S	5	I
Advisor Review	10	PI	S	3, 5	I

* Method of Feedback: **F** - Formative (written comments and/or oral discussion), **S** - Summative (numerical grade); ** I/T: **I** – Individual effort, **T** – Team effort.

Academic Integrity

Students are expected to conduct themselves in accordance with the highest ethical standards of the Profession of Engineering and evince academic integrity in all their pursuits and activities at the university. As such, in accordance with the *General Academic Regulations on Academic Integrity*, students are reminded that plagiarism or any other form of cheating in examinations, term tests, assignments, projects, or laboratory reports is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university). A student found guilty of contributing to cheating by another student is also subject to serious academic penalty.

Requirements/Regulations

- No programmable devices or systems (such as calculators, PDAs, iPods, iPads, cell phones, smart watches, wireless communication, or data storage devices) are allowed in examinations unless approved by the course instructor.
- All email communication must conform to the Communicating with Students university policy.

[Communicating with Students](#)

- Attending lectures and laboratories is essential for the successful completion of this course.
- Self-declaration forms may be completed for missed tests, exams, or assignments during short-term absences (≤ 72 hours) for extenuating circumstances. Students don't need to share personal information about their situation beyond declaring the nature of the extenuating circumstance on the self-declaration form.

[Self-Declaration Form for Brief or Temporary Absence](#)

- This form cannot be used for planned absences like vacations. It is also not to be used for longer-term absences, or ongoing circumstances (e.g., Authorized Withdrawals, Leaves of Absence, or other accommodations), which will still require additional documentation.

[Self-Declaration Policy for Brief or Temporary Absences](#)

- It is the responsibility of each student to contact the instructor in a timely manner if he or she is uncertain about his or her standing in the course and about his or her potential for receiving a failing grade. Students should familiarize themselves with the University's *General*

Academic Regulations, as well as Section 3 of the Faculty of Engineering *Academic Regulations* dealing with incomplete term work, deferred examinations, attendance, and withdrawal.

[General Academic Regulations](#)

[Engineering Academic Regulations](#)

- Students should be aware that they have access to an extensive range of resources and support organizations. These include Academic Resources, Counselling, Advocacy and Accessibility Offices as well as documentation of key University policies e.g. Academic Integrity, Respectful Behaviour, Examinations and related matters.

[Supplemental Resources](#)

Retention of Student Work

Students are advised that copies of their work submitted in completing course requirements (i.e. assignments, laboratory reports, project reports, test papers, examination papers, etc.) may be retained by the instructor and/or the department for the purpose of student assessment and grading, and to support the ongoing accreditation of each Engineering program. This material shall be handled in accordance with the University's *Intellectual Property Policy* and the protection of privacy provisions of *The Freedom of Information and Protection of Privacy Act (Manitoba)*. Students who do not wish to have their work retained must inform the Head of Department, in writing, at their earliest opportunity.

Copyright Notice

All materials provided in this course are copyright and are provided under the fair dealing provision of the Canadian Copyright Act. This material may not be redistributed in any manner without the express written permission of the relevant copyright holder.

[Copyright Office](#)

Deferred Final Examinations

Students who miss the regularly scheduled writing of a final examination for valid medical or compassionate reasons will only be allowed to write a deferred exam if the Associate Dean (Undergraduate) approves the request. All requests for a deferred examination *must* be made within 48 hours of the missed exam and follow the procedure described on the Faculty [website](#) without exception. Course Instructors *do not have the discretion* to grant deferred final examinations.

[Deferred Exam Policy \(student experience website\)](#)