University of Manitoba | Price Faculty of Engineering
Department of Biosystems Engineering

Course Outline

Instructor
- Dr. Mashiur Rahman
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Student Hours
- Dr. Rahman: Please e-mail to schedule appointment.

Contact Hours
- 3 credit hours
- Lectures:
  3 hours x 12.3 weeks = 37 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 Anishinaabeg, Ininiwak, Anisininewuk, Dakota Oyate and Dene, and on the National Homeland of the Red River Métis.

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 2026

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 and Referencing Style

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.

Course Delivery

Lectures will be sent to the student by email. Student will review the lecture materials, and the instructor will respond to any questions or clarifications.

The Department of Biosystems Engineering has devised a plan so that there is minimal impact on the delivery and content of the course, should the instructor fall sick and be unable to continue lectures. Please be assured that the alternative plan outlining any deviation from the normal mode of instruction will be communicated to you as quickly as possible if/when the need arises.

Important Dates

- **Early Withdrawal Deadline**
  Jan. 19, 2026
- **Louis Riel Day**
  Feb 16, 2026
  No classes or examinations
- **Research Proposal**
  Feb. 4, 2026
- **Annotated Bibliography**
  Feb. 20, 2026
- **Winter Term Break**
  Feb. 16-20, 2026
  No classes or examinations
- **3MT**
  March 5, 2026
- **Thesis Roadmap**
  March 24, 2026
- **Good Friday**
  April 03, 2026
  No classes or examinations
- **Voluntary Withdrawal Deadline**
  March 19, 2026
- **Written Report**
  April 10, 2026
- **Last Day of Classes**
  April 9, 2026
- **Oral Presentation**

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

CEAB Graduate Attributes Assessed

This course will assess the following CEAB graduate attribute indicators shown below:

Indicator (Level)	Indicator Description	Assessment Points
IN.1 (A)	Gathers information (literature review, measurements, experiments, laboratory exercises) and analyzes data)	Annotated Bibliography & Written Report
IN.2 (I)	Devises and/or implements an appropriate plan / methodology for gathering information required to solve a complex engineering problem	Thesis Proposal
IN.3 (A)	Interprets results and reaches appropriate conclusions	Written Report
CS.1 (A)	Designs and produces effective written and graphical engineering documents for specific audiences (e.g., research reports, engineering reports, design documents)	Written Report
CS.2 (A)	Designs, produces, and delivers effective technical presentations for specific audiences	Final Presentation
LL.3 (A)	Demonstrates research and information literacy skills	Written Report

Assignments

The marks and grade for this course are based on six (6) Assignments:

1. Research Proposal (5 points);
2. Annotated Bibliography (5 points);
3. 3-Minute Thesis (3MT) video (5 points);
4. Thesis Roadmap & writing session (5 points);
5. Oral presentation of your Thesis Report (20 points);
6. Thesis Report (50 points).

*Supervisor's evaluation: Your Thesis Supervisor will provide an evaluation of your research activities (10 points).
Total: 100 marks

Evaluation

Component	Value (%)	Assessor	Method of Feedback*	Learning Outcomes Evaluated	I/T**
Research Proposal: Due Feb. 4	5	Rahman	S	2	I

Accreditation Details

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

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

I - Introduced
D – Intermediate (Developing)
A - Advanced

Grading Scale

Note: These boundaries represent a 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

Component	Value (%)	Assessor	Method of Feedback*	Learning Outcomes Evaluated	I/T**
Annotated Bibliography: Due Feb 20	5	Rahman	F, S	1, 2, 3,	I
3MT Presentation: Due March 5	5	Rahman	F, S	2, 3	I
Thesis Roadmap: Due March 24	5	Rahman	F, S	2, 3	I
Oral Presentation: April 07	20	Dept.	F, S	3	I
Written Report: Due April 10	50	Rahman, PI, TBD	F, S	3	I
Advisor Review	10	PI	S	3	I

* Method of Feedback: **F** - Formative (written comments and/or oral discussion), **S** - Summative (numerical grade); ** I/T: **I** – Individual effort, **T** – Team effort. TBD: To be determined. PI: Principal Investigator (advisor).

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, such as use of Artificial Intelligence (AI) 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

- All email communication must conform to the Communicating with Students university policy.

  Communicating with Students

- Attending lectures 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)