



Course Outline

Instruction Team

- Derek Inglis (he/him)
A206 AEB
(204) 474-7964
- (204)470-5290
Derek.Inglis@umanitoba.ca

Student Hours

- Mr. Inglis will be present during lecture/ labs
- Thursdays 3:00 – 4:00 PM (office)
- Individual assistance is always available by appointment: talk to me.

Teaching Assistant

- N/A

Location

- **319 Education**
MWF, 8:30 – 9:20 AM
- **EITC E2 320**
M, 2:30 – 5:15 PM

Contact Hours

- 4 credit hours
- Lectures:
3 hours x 12 weeks = 36 hours
- Lab Time:
3 hours x 12 weeks = 36 hours

Prerequisites:

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 4390 Unit Operations 1 Fall 2023

Course Objectives

To introduce engineering students to design, application, and characteristics of operation systems, including property of particulate solids, pneumatic systems, particle size reduction, and mechanical conveyors such as belt, screw, vibratory, chain-type, and bucket conveyors.

Course Content

This course introduces the design, application, and characteristics of operation systems, including property of particulate solids, pneumatic systems, particle size reduction, and mechanical conveyors such as belt, screw, vibratory, chain-type, and bucket conveyors. On satisfactory completion of this course, students will be able to:

- understand the effect of physical properties on the selection of unit operation systems,
- select the most suitable operation system for a given application
- evaluate the design variables and performance for operation systems, and
- design operation systems for different applications.

Laboratory work will also provide students with an opportunity to collaborate equitably with group members in a team setting to manage an engineering testing project and write a technical report.

Course Delivery

Lectures and Lab Time will proceed as listed in the left and this time will be used to deliver course content, provide time for lab assignments, project work and presentations.

Considering the ongoing pandemic please note:

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 is unable to continue lectures in-person. 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.

Recommended Reading

The Instructor will supply Materials through the course website (www.umlearn.com). It is recommended to purchase M.E. Fayed and T.S. Slocir, 1997. Mechanical Conveyors, Selection and Operation. Technomic Publishing Co. Inc.

Accreditation Details

Accreditation Units

- Mathematics: 0%
- Natural Science: 0%
- Complementary Studies: 0%
- Engineering Science: 0%
- Engineering Design: 100%

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

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 year-to-year grading consistency.

Letter	Mark
A+	92-100
A	85-91
B+	78-84
B	72-77
C+	66-71
C	60-65
D	51-59
F	< 50

Learning Outcomes

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

No.	Learning Outcome
1	Understand the effect of physical properties on the selection of unit operation systems.
2	Select the most suitable operation system for a given application.
3	Evaluate design variables and performance for operating systems.
4	Design operation systems for different applications.
5	Use project management principles and tools.

Graduate Attribute Competency Levels Developed

Outcome	KB	PA	IN	DE	ET	IT	CS	PR	IE	EE	EP	LL
1	4											
2				4								
3				4								
4		4	4									
5							4				3	

CEAB Graduate Attributes Assessed

- KB.3 – Recalls and defines, and/or comprehends and applies information, first principles and concepts in fundamental engineering science.
 PA.3 – Analyzes and solves complex engineering problems.
 CS.2 – Designs and produces appropriate engineering documents (i.e., research reports, engineering reports, design documents, graphics).
 DE.1 – Understands the complexities of an open-ended engineering design problem and defines appropriate objectives and constraints
 DE.3 – Develops possible solutions to an open-ended design problem, leading to an appropriate recommendation
 EP.2 – Understands concepts of project management.

Important Dates

- **Early Withdrawal Deadline**
September 19, 2023
- **National Day for Truth and Reconciliation**
Mon. Oct. 2, 2023
No classes or examinations
- **Thanksgiving**
Mon. Oct. 9, 2023
No classes or examinations
- **Fall Term Break**
Nov. 13-17, 2023
No classes or examinations
- **Remembrance Day (observed)**
Mon. Nov. 13, 2023
No classes or examinations
- **Voluntary Withdrawal Deadline**
November 21, 2023
- **Presentation of Term Project**
Due: December 8, 2023 8:30am
- **Last Day of Classes**
Mon. Dec. 11, 2023

Evaluation

Late assignments will be assessed a penalty of 10% per day or part thereof (including weekends).

Component	Value (%)	Assessor	Method of Feedback*	Learning Outcomes Evaluated	I/T**
Lab assignments	15	DI	S	1, 3	I
Term Project	25	DI	S	5	T
Mid-Term Exam	20	DI	S	1, 2, 3	I
Final Exam	40	DI	S	1, 2, 3, 4	I

* Method of Feedback: F - Formative (written comments / oral discussion), S - summative (numerical grade)

** I/T: I – Individual effort, T – A 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

- Please copy the Instruction Team in all emails (Instructors and Teaching Assistants). All email communication must conform to the Communicating with Students university policy.
[Communicating with Students](#)
- As the Instruction Team, we will do our best to respond to all emails **within 48 hours during working hours** (8:30 AM – 5:30 PM Monday thru Friday). Ex. A Friday night email may not be responded to until the following Tuesday.
- Self-declaration forms may be completed for missed tests, exams, or assignments during short-term absences (≤ 72 hours) for extenuating circumstances. 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 Form for Brief or Temporary Absence](#)
[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*.
[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](#)

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 \(student experience website\)](#)

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 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.

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