



Course Outline

Instruction Team

- Dr. (Ranjan) Sri Ranjan, P.Eng.
(he/him)
E1-346 EITC
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Student Hours

- Individual assistance is always available by appointment: talk to me.

Teaching Assistant

Thushyanthy Akileshan
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Location

- **260 Helen Glass Centre**
Lecture MWF 1:30 - 2:20 PM
- **E2-350 EITC Bldg**
Lab W 2:30 – 5:15 PM

Contact Hours

- 3 credit hours
- Lectures:
3 hours x 12 weeks = 36 hours

Prerequisites:

- Consent of the instructor

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 7140 Advanced Irrigation and Drainage

Fall 2023

Course Description

Selected advanced problems and new developments in irrigation and drainage. Interrelationships between irrigation and drainage and the environment. Prerequisite: consent of instructor.

Course Objectives

Students in this course are expected to attend the BIOE 4600 course for all the assignments, tests, and a group project. In addition, the course will cover advanced topics in irrigation and drainage through a literature review. The topics covered will include,

1. Measurement of properties of soil
2. Advances in irrigation system design
3. Advances in drainage system design
4. Salinity prevention
5. Environmental impacts

Class Schedule

The schedule will be the same as BIOE 4600.

Recommended Reading

Course hand-outs will be available through UMLearn.

Supplementary material

- Eisenhauer, D. E., Martin, D. L., Heeren, D. M. & Hoffman, G. J. (2021). Irrigation Systems Management, ASABE. doi:10.13031/ISM.2021, CC BY-NC-ND 4.0, <https://creativecommons.org/licenses/by-nc-nd/4.0/>
- Huffman, R. L., D.D. Fanmeier, W.J. Eliot, S.R. Workman, and G.O. Schwab. 2013. Soil and water conservation engineering. 7th Edition. ASABE, St. Joseph, MI <https://elibrary.asabe.org/textbook.asp?confid=swce2012>
- Food and Agriculture Organization of the United Nations. 2002. Crop evapotranspiration: guidelines for computing crop water requirements. Eds. R. G. Allen et al. FAO, Rome.
- Nijiland, H.J., F.W. Croon and H.P. Ritzema. 2005. Subsurface Drainage Practices. Wageningen, Alterra, ILRI Publication No. 60, pp. 608
- Ritzma, H.P. (Editor-in-Chief). 2006. Drainage Principles and Applications. Wageningen, Alterra, ILRI Publication No. 16, pp. 1125.
- Smedema, L.K., W.F. Vlotman, and D.W. Rycroft, 2004. Modern Land Drainage – Planning, design and management of agricultural drainage systems
- Tanji, K.K. (Editor). 1990. Agricultural Salinity Assessment and Management. ASCE, New York. NY. [ISBN #0-87262-762-4]
- Hillel, D. 1998. Environmental Soil Physics. Academic Press (ISBN: 0-12-348525-8)

Additional Materials

The following journals provide recent research information on the topics covered in this course:

- Canadian Biosystems Engineering Journal
- Transactions of the ASABE
- Applied Engineering in Agriculture
- Biosystems Engineering
- Agricultural Water Management
- Journal of Soil and Water Conservation

Useful Websites

www.bioeng.ca; www.asabe.org; www.asce.org; www.fao.org

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

- **Last Day of Classes**
Mon. Dec. 11, 2023

Grading Scale

Letter Grade	Percentage out of 100
A+	92-100
A	85-91
B+	78-84
B	72-77
C+	66-71
C	60-65
D	50-59
F	Less than 50

Assignment Feedback

Students can expect to receive graded assignments within two weeks of their submission.

Late Submission Policy

Assignments submitted after the due date will be docked 10% per day.

Referencing Style

Students are expected to follow the citation style that is used by the *Canadian Biosystems Engineering* journal when citing references in course assignments.

Evaluation

Assignment	Allocation	Description	Due Date
Completion of requirements for BIOE 4600	70%	All labs, mid-term test, group project presentation/report and final exam will have to be completed	
Paper Critique	30%	Students will be assigned journal papers to provide a critical review.	TBD

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](#)

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. 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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[Copyright Office](#)