



CIV E 635 Environmental Fluid Mechanics

Winter 2024 - January 08 to April 12

Class time: Tuesday, Thursday 15:30-16:50 Location: NRE 2-122

Instructor:

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Donadeo Innovation Centre For Engineering 7-271
Office Hours: Tuesday and Thursday after lecture

Course Description:

*3 (fi) (either term, 3-0-0) Mixing processes and pollutant transport in rivers, lakes, estuaries, coastal waters, and the atmosphere.

Prerequisites: CIV E 631

Course synchronous and asynchronous content delivery schedule:

Lectures are synchronous.

TA Information:

No TA.

Seminar Sections:

Section	Day	Time	Location
Lecture	Tuesday	15:30-16:50	NRE 2-122
Lecture	Thursday	15:30-16:50	NRE 2-122

Course Objectives & General Content:

This course studies the transport and mixing (or fate) of pollutants and nutrients in natural and man-made aquatic systems and in atmosphere.

The content of this course:

1. Fickian Diffusion
2. Turbulent Diffusion and Shear Flow Dispersion
3. Mixing in Rivers
4. Turbulent Jets and Plumes
5. Stratified Flows
6. Physical Processes in Lakes and Reservoirs

Learning Outcomes:

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

1. understand the fundamentals in transport and mixing of pollutants and nutrients in in natural and man-made aquatic systems and in atmosphere.
2. calculate and assess the transport and mixing of pollutants and nutrients in different environments
3. design engineering structures (e.g., diffusers) to minimize environmental impacts of pollutants

Marking Scheme:

Activity	(A)Synchronous	Due/Scheduled	Weight
Assignments	Asynchronous		15%
Project	Asynchronous		25%
Final Exam	Synchronous		60%
Course Participation - Bonus	Synchronous		10%

The Faculty recommended grade point average for a 600 level course is 3.3. Instructors have the leeway to deviate from this average and can assign grades based on their own scheme. All grades are approved by the department chair (or delegate). The office of the Dean has final oversight on all grades.

Term Work

All term work solutions will be posted no later than the last day of classes. All term work will be returned to students by the final day of classes, with the exception of major term work due in the last week of classes. The latter will be returned by the day of the final examination or the last day of the examination period if there is no final examination in the course as per university policy; instructors will make accommodations to return these term work. It is the responsibility of the student to pick up all their term work at the specified time and place. Any unreturned term work, shall be retained and then shredded six months after the deadline for reappraisal and grade appeals. Final examinations will be kept for one year as required by university guidelines and the Government of Alberta's Freedom of Information and Protection of Privacy Act.

Additional Notes

Need to have the Faculty of Engineering approved sticker.

Calculator Policy

Only approved non-programmable calculators are permitted in examinations. Any calculator taken into an examination must have a sticker identifying it as an acceptable non-programmable calculator (gold sticker). Students can purchase calculators at the University Bookstore with the stickers already affixed. Calculators purchased elsewhere can be brought to the Student Services where the appropriate sticker will be affixed to the calculator.

Text and References (Mandatory):

Fischer, H.B.. et al. (1979). Mixing in Inland and Coastal Waters, Academic Press.

Did you know that the University of Alberta has various low-to-no-cost services to help students succeed? Visit <http://www.deanofstudents.ualberta.ca/> for information about the academic, wellness, and various other support services available to U of A students. It's never too early or too late to seek help!

UNIVERSITY AND FACULTY POLICIES

COURSE OUTLINE POLICY

The policy about course outlines can be found in Course Requirements, Evaluation Procedures and Grading of the University Calendar, see <https://calendar.ualberta.ca/>

RESPECT AND PROFESSIONALISM

The Faculty of Engineering is committed to fostering and protecting an equitable, inclusive, and respectful work and study environment in line with University of Alberta policies and professional engineering industry standards. University is an opportunity for students to explore areas of interest and to potentially pursue a career in a specific field. The Faculty of Engineering prepares students to uphold industry standards to become a Professional Engineer (P. Eng). Respect, professionalism, and accountability must be upheld within the Faculty of Engineering.

Harassment and discrimination are serious issues that have a negative effect on culture and therefore the [Student Conduct Policy](#) states that no student shall discriminate against or harass any person or group of persons. The Faculty expects an environment free of harassment, discrimination, and bullying. Please refer to the [Definitions for Discrimination, Accommodation and Harassment](#).

SAFETY DURING LEARNING ACTIVITIES

In all Faculty of Engineering courses, labs, seminars or other learning activities, safety is of paramount importance. In some cases, laboratory work in a program requires high standards for risk management to keep potential hazards safely under control. Anyone found to be unable to function safely, due to intoxication, harassment or discriminatory behaviour, or other reasons, in the class, lab, seminar or other learning activity may be asked to leave or be removed for their and the safety of other participants and instructors in alignment with the Student Code of Behaviour or Student Conduct Policy. As members, or prospective members, of the engineering profession, it is your responsibility to identify and inform the proper authorities of an unsafe work/learning environment.

AUDIO/VIDEO RECORDING

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Only those items specifically authorized by the instructor may be brought into the exam facility. The use of unauthorized personal listening, communication, recording, photographic and/or computational devices is strictly prohibited. Students should refrain from bringing any unauthorized electronic device into an examination room, including cell phones, high tech watches, high tech glasses or other such devices.



ACADEMIC INTEGRITY

Students at the University of Alberta must follow, in its entirety, the **Code of Student Behavior**. Failure to know the Code is not an acceptable excuse for breaking the Code.

If you have not already done so, make sure you review the Code, which is found here along with other resources:
<https://www.ualberta.ca/natural-applied-sciences/portfolio/education/academic-integrity-and-discipline.html>

Engineering students studying in the province of Alberta should also follow the

Code of Ethics

by The Association of Professional Engineers and Geoscientists of Alberta (APEGA), which is found here: <https://www.apega.ca/members/legal-obligations>

The Code of Student Behavior should not be too hard to follow. Listen to your instructor, be a good person, and do your own work, as this will lead you toward a path to success. Failure to follow the Code can result in a grade of 'F' for the course, a transcript remark, suspension, and even expulsion from the university.

"Integrity is doing the right thing, even when no one is watching"
C.S. Lewis



Engineering at Alberta

NEED HELP?

There are a lot of services available to students on campus and in Edmonton, and sometimes it's hard to know where to go. While this isn't a comprehensive list, the services shown here should at least give you some ideas about where to start. If you're still not sure, check out the services just beneath this box—they'll give you the guidance you're looking for.

DON'T KNOW WHERE TO GO?

Student Service Centre

The U of A's central hub to find the right help for your needs.

uab.ca/ask

24/7

Empower Me (international)

1-833-628-5589

HELP

Edmonton Distress Line

780-482-4357 (HELP)

WELLNESS

Wellness Supports

Free 1:1 support for students in the areas of housing, finances, academics, personal wellness, life skill development, family dynamics, system navigation, and any area of life where there is a desire to invite change.

P: 780-492-1619 | E: wellness@ualberta.ca

M-F, 8:30am-4:30pm (Sep-April), 8:00am-4:00pm (May-Aug)

Counselling and Clinical Services

Free, short-term, appointment-based counselling and psychiatric services. Also offers drop-in workshops. Book an initial consultation.

P: 780-492-5205 | M, R, F, 8:00am-4:00pm; T, W, 8:00am-7:00pm

Interfaith Chaplains' Association

Get guidance, care, and support, whether or not you identify with a particular faith. Make an appointment.

P: 780-492-0339 | E: interfaithchaplains@ualberta.ca

The Landing

Offers drop-in support on matters of gender and sexual diversity.

P: 780-492-4949 | E: thelanding@su.ualberta.ca | M-R, hours vary

Peer Support Centre

Anonymous, confidential help from trained students. By appointment only.

P: 780-492-4268 | E: psc@su.ualberta.ca | M-F, 9:00am-8:00pm

Sexual Assault Centre

Free, anonymous, and confidential drop-in counselling.

P: 780-492-9771 | E: sexualassaultcentre@ualberta.ca

M-F, 9:00am-8:00pm

University Health Centre

An on-campus health clinic that provides medical services to staff, students, and their spouses and children.

P: 780-492-2612 | E: hws@ualberta.ca | M-F, 8:30am-4:00pm

ACADEMIC

Engineering Student Services

Drop-in, first-come, first-served advising.

E: enggadvising@ualberta.ca

Engineering Student Success Centre

Drop-in tutoring for first-year courses.

E: dessc@ualberta.ca

Academic Success Centre

Many services to maximize your academic success. E:

success@ualberta.ca | M-F, 8:30am-4:30pm

Academic Accommodations

Connects students with disabilities to

accommodations. E: arrec@ualberta.ca

M-F, 8:30am-4:30pm

Office of the Student Ombuds

Call for complex problems and conflict mediation.

P: 780-492-4689 | E: ombuds@ualberta.ca

FINANCIAL

Student Service Centre

For awards and other funding supports.

uab.ca/ask

Campus Food Bank

Many food support options available. E:

info@campusfoodbank.com

SOCIAL

Unitea

Arrange a time to socialize with a peer.

E: unitea@ualberta.ca

BearsDen

U of A webpage. Find student groups, local events, and volunteer opportunities.

WORRIED ABOUT SOMEONE?

Helping Individuals at Risk (HIAR)

If you're worried about someone because of the things they've been saying or doing, or there's a noticeable change in their behaviour (often in multiple ways), contact HIAR, who will protect your confidentiality and help decide how best to support the person.

780-492-4372

hiarua@ualberta.ca

CONFIDENTIAL SUPPORT

Office of Safe Disclosure and Human Rights

The OSDHR advises confidentially on sensitive issues you may not feel comfortable solving on your own. Contact the OSDHR if you want to get help or to make a report while keeping your privacy.

780-492-7357

osdhr@ualberta.ca