

**The University of Western Ontario
Faculty of Engineering
Department of Civil and Environmental Engineering**

CEE 9634 – Environmental *Stratified Flows* in Inland and Coastal Waters

Course Outline – Summer 2018

Objectives:

The objectives of the course are (i) to apply the principles of hydraulics and fluid mechanics, and (ii) analyse and develop engineering solutions, for a wide range of environmental stratified flows encountered in inland and coastal waters.

Main Topics:

Thermosaline equation of state of water
Hydrostatics of stratified bodies of water
Energy and momentum principles applied to stratified flows
Single and multi-port diffusers using jets, plumes and fountains
Stratified mixing and cooling channels
Selective withdrawal at water intakes

Prerequisites:

Undergraduate course in hydraulics or fluid mechanics.
Basic knowledge of *open channel hydraulics* is relevant to this course.
Familiarity with the use of a programmable calculator and a computer spreadsheet.

Corequisite:

None

Contact Hours:

Lectures: July 16 - August 3, 2018
Monday to Friday, 9:30am – 11:30am

Instructor:

Professor Emeritus: R.E. Baddour, PhD, P.Eng.; rbaddour@uwo.ca
Administrative Support: SEB 3009, civilgrad@uwo.ca

Textbook

Course Notes will be available from the Bookstore.

References:

Specific Journal papers from the literature will be recommended for each topic
Open Channel Hydraulics by T.W. Sturn, 2nd Ed, McGraw-Hill 2010

Assignments:

A minimum of four assignments involving theory and numerical calculations will be provided throughout the course. Independent solutions of these assignments must be submitted by the due dates. Solutions and numerical calculations often require the use of a programmable calculator and/or a computer spreadsheet.

Final Examination:

The final examination is *open book* and of *3-hrs* duration.

Units:

SI unit system is adopted in this course

Evaluation:

Assignments: 40%

Final examination*: 60%

*Students must pass the final examination to pass this course. Students who fail the final examination will be assigned the aggregate mark, as determined above, or 48%, whichever is less.

Use of English

In accordance with Senate and Faculty Policy, students may be penalised up to 10% of the marks on all assignments, tests, and examinations for the improper use of English. Additionally, poorly written work with the exception of the final examination may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.

Cheating:

University policy states that cheating is a scholastic offence. The commission of a scholastic offence is attended by academic penalties that might include expulsion from the program. If you are caught cheating, there will be no second warning.

Attendance:

Any student who, in the opinion of the instructor, is absent too frequently from class will be reported to the Dean (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean, the student will be debarred from taking the regular final examination in the course.

Sickness and Other Problems:

Students should immediately consult with the Instructor or Department Chair if they have any problems that could affect their performance in the course. Where appropriate, the problems should be documented (see attached document). The student should seek advice from the Instructor or Department Chair regarding how best to deal with the problem. Failure to notify the Instructor or Department Chair immediately (or as soon as possible thereafter) will have a negative effect on any appeal.

Note: The attached document “*Instructions for students unable to write tests or examinations or submit assignments as scheduled*” is considered part of this course outline