ENGINEERING 8751: Coastal and Ocean Engineering

Instructor **Dr. Stephen E. Bruneau** **Teaching Assistants: 1 TBD**
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Office Hours **Tues 2-4**

Website **D2L & http://www.engr.mun.ca/~sbruneau/teaching/8751ocean/index.htm**.

COMMUNICATION

Through lectures Monday, Wednesday and Friday: 10:00 – 10:50 and via mun email (not d2l email) in the event of class changes or other issues. Contact the professor at his office or by email.

CALENDAR ENTRY:

Coastal and Ocean Engineering examines the coastal and ocean environment; ocean circulation and properties; waves and tides; instrumentation and measurement. Additional topics will be drawn from the areas of hydraulic, geotechnical and structural engineering. Relevant field exercises will be conducted.

PREREQUISITES: ENGI 6713, or, as approved by discipline chair.

SCHEDULE: LECTURE: Mon, Wed, Fri. 10:00-10:50 pm Room: EN2050

CREDIT VALUE: 3 credits

TEXT BOOK: None assigned, several resources used,

MAJOR TOPICS:

Part 1 The Ocean Environment
Composition
Circulation
Waves, Tides, Currents
Wave and Current Theory
Advanced Wave Theory

Part 2 Offshore Structures and Environmental Loads
Oil and Gas industry primer
Offshore Structure Types
Design Waves and Wave Loads
Wind and Current Loads,
Pipelines and Piles
Ice properties and loads
Monte Carlo Simulation

Part 3 Coastal Processes and Structures
Coastal environment, Types of Structures
Breakwater Design
Crib design
Coastal Wave Effects and Forecasting
Sediment transport

Part 4 Materials and Corrosion
Materials and Design for Corrosion
Ocean Instrumentation

Special Topics and Case Studies as time permits.

LEARNING METHODOLOGY AND OUTCOMES:

ENGI 8751 Coastal and Ocean Engineering is:

- An introduction to a wide range of topics in coastal and ocean engineering.
- It will provide students with the technical background and methodologies for solving first order engineering problems in the coastal and ocean environment.
- The course will lean towards design challenges associated with the harsh environment of Canada's east coast and examples of engineering works in this environment will be discussed.
- The students will be required to identify many coastal engineering elements through a field reconnaissance project and will be solving realistic and relevant design problems.

Upon successful completion of this course, the student will be able to:

1. Identify elements, problems and challenges in the coastal and ocean environment, relate these to existing solutions and perform first order computations to apply these solutions to any given challenge.
2. Source and utilize more advanced methodologies for design given an appreciation of the fundamentals learned in this course.
3. Develop critical analysis skills by considering case studies in the coastal and ocean engineering field.
4. Have a working familiarity with the coastal and ocean environment of Newfoundland and Labrador.

ASSESSMENT:

Item	Value	Submission	Material	Due Date (Approx)
Problem Sets	10%	Individual	N/A	March 26th
Scavenger Hunt	10%	Group	N/A	March 26th
Quiz 1	10%	Individual	Closed book	Jan 29th
Quiz 2	10%	Individual	Closed Book	March 12th
Mid Term	20%	Individual	Open Book	Feb 12th
Final Exam	40%	Individual	Open Book	TBA

ACADEMIC INTEGRITY AND PROFESSIONAL CONDUCT:

Students are expected to conduct themselves in all aspects of the course at the highest level of academic integrity. Any student found to commit academic misconduct will be dealt with according to the Faculty and University practices. More information is available at www.engr.mun.ca/undergrad/academicintegrity.

Students are encouraged to consult the Faculty of Engineering and Applied Science Student Code of Conduct at http://www.engr.mun.ca/policies/codeofconduct.php and Memorial University's Code of Student Conduct at http://www.mun.ca/student/home/conduct.php.

For many students Engineering 8751 is one of the final courses they will take prior to entering the workforce as a professional engineer-in-training. The profession is self-regulated and has an overarching goal to protect the public and exercise problem solving skills with integrity and above-average ethical conduct. Expression of these traits through respectable group interaction where required and through honest independent work effort where that is expected, is a desired outcome of this course.

In class, students are required to have their laptops, tablets, smartphones put away unless requested otherwise by the instructor. Note taking is optional as lecture and tutorial slides are all available on the course website. Talking, eating and sleeping during lectures is not permitted, it distracts others including the instructor.

LAB and FIELD SAFETY:

Students are expected to demonstrate awareness of, and personal accountability for, safe laboratory and field conduct. Appropriate personal protective equipment (PPE) must be worn (e.g. steel-toed shoes, safety glasses, etc.) and safe work practices must be followed as indicated for individual laboratories, materials and equipment. Students will immediately report any concerns regarding safety to the teaching assistant, staff technologist, and professor.

INCLUSION AND EQUITY:

Students who require physical or academic accommodations are encouraged to speak privately to the instructor so that appropriate arrangements can be made to ensure your full participation in the course. All conversations will remain confidential.

The university experience is enriched by the diversity of viewpoints, values, and backgrounds that each class participant possesses. In order for this course to encourage as much insightful and comprehensive discussion among class participants as possible, there is an expectation that dialogue will be collegial and respectful across disciplinary, cultural, and personal boundaries.

STUDENT ASSISTANCE: Student Affairs and Services offers help and support in a variety of areas, both academic and personal. More information can be found at www.mun.ca/student.