ONAE 7000: OCEAN SYSTEMS DESIGN

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Office Location: **EN 4011**
Office Hours: **Tuesday and Thursday 2-3 PM**

Course D2L Website: https://online.mun.ca/login.asp

Communication: *Students are free to raise concerns of any kind with me during class or outside of class. If students would like to schedule time to discuss any course work or concerns at length, it would be best to contact me via email to set up a time to meet. Announcements regarding course scheduling will be made on the d2l course shell, as well as during class time.*

Assignment, Project and Other Submissions: *Reports/assignments should be typed and printed for submission. The design technique presentation and final report will involve an oral presentation component and the use of visual presentation aids are strongly encouraged.*

CALENDAR ENTRY:

Ocean Systems Design develops concept design methods for marine systems from need definition through to solution selection, including weight, cost and power requirements estimating, selection of principal design characteristics and evaluation of alternative solutions. Students develop a proposal for a marine system design project which will include a statement of requirements, a parametric study, a work plan and schedule. This design project will be completed as a full design in ENGI 8000.

CR: *the former ENGI 7052*
LH: *at least 3-hour sessions per week*
PR: *ENGI 3001, ENGI 3054, ENGI 4102*

LAB EXPERIENCE: **Physical**
CREDIT VALUE: **3 Credits**
COURSE TYPE: **Compulsory**
ACCREDITATION UNITS: **3/0/0 (Lecture/Lab/Tutorial)**

CONTENT CATEGORIES:

Math	Natural science	Complementary Studies	Engineering Science	Engineering Design
			50%	50%

COURSE DESCRIPTION:

This course is a "training" course for the capstone project, ENGI 8000. Students will be assessed on fundamental naval architecture analyses that they will be required to use in their capstone design projects. Students will also be required to complete a group project where they can complete the initial stages of a design, which could end up being their capstone design project in their following academic term.

SCHEDULE:

Lecture Classroom: **EN 2078**
Lecture Schedule: **Tuesday and Thursday 3:00PM – 4:30PM**

RESOURCES:

Text Books:

- No official textbook. Material will be uploaded to d2l website.

References:

- Lamb, Thomas, 'Ship Design and Construction' SNAME, 2003
- Watson, David, 'Practical Ship Design' Elsevier, 1998
- Principles of Naval Architecture

MAJOR TOPICS:

- Problem Statement and Statement of Requirements
- Ship Design and Project Management
- Parametric Design and Vessel Particulars
- Hull Generation and General Arrangement
- Vessel Stability and Weight Estimates
- Resistance and Propulsion Prediction and Engine Selection
- Ship Structural Design
- Seakeeping Analysis
- Safety and Emergency Response
- Regulation and Classification of Ships
- Valuation and Risk

LEARNING OUTCOMES:

Brief description of expected learning outcomes.

	Learning Outcomes	Graduate Attributes level	Assessment Tools
1	Understand how to synthesize ship design requirements and make trade-offs between competing requirements	KB.7-A, KB.8-A, PA.2-A, Des.1-D, Des.2-D, Des.3-D, Tools.1-D, Team.1-D , Team.2-D, Team.3-D, Comm.1-A, Impacts.1-D, Impacts.2-D, Impacts.3-D, Econ.1-A, Econ.2-A	Assignments, Project
2	Understand how to perform a parametric study, select vessel principle particulars, and generate a hull form and use relevant software	KB.7-A, KB.8-A, KB.3-A, PA.2-A, Des.1-D, Des.2-D, Des.3-D, Tools.1-D, Comm.1-A	Assignment 1, design technique presentation
3	Understand how to perform intact and damage stability prediction for a vessel, including selection of	KB.7-A, KB.8-A, KB.3-A, PA.2-A, Des.1-D, Des.2-D, Des.3-D, Tools.1-D,	Assignment 2, design technique presentation

	compartment size and tank sizes and use relevant software	Comm.1-A	
4	Understand how to make a ship resistance and propulsion prediction and select appropriately sized engines and use relevant software	KB.7-A, KB.8-A, PA.2-A, Des.1-D, Des.2-D, Des.3-D, Tools.1-D, Comm.1-A	Assignment 3, design technique presentation
5	Understand how to determine ship scantling sizes for a midship section to withstand global loads on a hull and verify against classification rules	KB.7-A, KB.8-A, PA.2-A, Des.1-D, Des.2-D, Des.3-D, Tools.1-D, Comm.1-A	Assignment 4, design technique presentation
6	Understand the impacts of ship seakeeping, economics, safety, other design considerations on the overall ship design	KB.7-A, KB.8-A, PA.2-A, Des.1-D, Des.2-D, Des.3-D, Tools.2-D, Comm.1-A, Impacts.1-D, Impacts.2-D, Impacts.3-D, Econ.1-A, Econ.2-A	design technique presentation
7	Understand how to create a problem statement and statement of work for a ship design	KB.7-A, KB.8-A, Des.3-D, Team.1-D , Team.2-D, Team.3-D, Comm.1-A, Econ.1-A, Econ.2-A	Project
8	Communicate effectively, ship design considerations and key Naval Architecture analyses, in written form	Team.1-D , Team.2-D, Team.3-D, Comm.1-A	Assignments, Project report
9	Communicate effectively, ship design considerations and key Naval Architecture analyses, orally	Team.1-D , Team.2-D, Team.3-D	Project presentation, design technique presentation
10	Be able to effectively work in groups	Team.1-D , Team.2-D, Team.3-D, Econ.1-A	Project

Key: I-Introduced, D-Developed, A-Applied
See www.mun.ca/engineering/undergrad/graduateattributes.pdf for definitions on the 12 Graduate Attributes and the Content Instructional Levels.

ASSESSMENT:

Method	**Credit**	**Due Dates**
Assignments	*60% (15% each)*	
Assignment 1		*June 3*
Assignment 2		*June 24*
Assignment 3		*July 8*
Assignment 4		*July 22*
Design Technique Presentation	*20%*	*July 12 & 14*
Final Group Project	*20%*	
Report	*(75% of 20 – 15%)*	*August 4*
Presentation	*(25% of 20 – 5%)*	*August 2 & 4*

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 http://www.mun.ca/engineering/undergrad/academicintegrity.php

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

INCLUSION AND EQUITY:

Students who require accommodations are encouraged to contact the Glenn Roy Blundon Centre, http://www.mun.ca/blundon/about/index.php. The mission of the Blundon Centre is to provide and co-ordinate programs and services that enable students with disabilities to maximize their educational potential and to increase awareness of inclusive values among all members of the university community.
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.