

# OCSC 4500 & BIO 4710 – Experimental Marine Ecology (Spring/ Summer 2022) Generalized Syllabus

## Course Instructor:

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## Teaching Assistant (TA):

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Name	Office	Phone	E-mail address
TD	NA	NA	

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## Course Format:

A two-week, all-day, intense laboratory course at the Bonne Bay Marine Field Station taught during the summer every second year. Most days will start with a lecture, introducing students to that day, before each team starts on their activities and we often end with a get together or lecture. The schedule will remain flexible to accommodate weather, logistical factors, and your experiments. Workload will require some work over the weekends such as sampling of ongoing experiments. See time plan, and remember plans are subject to change and will be updated continuously.

## Course Description:

*Experimental Marine Ecology* explores a variety of oceanographic experimental approaches, their design and ability to gain a mechanistic understanding of cause and effect. The course focuses on hands-on learning, with each team of students planning and conducting their own experiment, targeting specific hypothesis centered on plankton, and presenting the gathered results at the end. The course covers the different research steps from developing a hypothesis to presenting the findings, including experimental design, sample collection, oceanographic analysis methods, data interpretation, quality control, and processing.

## Learning Objectives:

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

- Explain and compare advantages and weaknesses of different experimental approaches
- Discuss the principles of addressing a specific research question with a targeted experiment
- Design a simple experiment to address a hypothesis
- Be familiar with some basic oceanographic analysis techniques
- Write a lab-protocol – aligned with existing courses
- Generate data sheets and quality control collected data
- Interpret results gained from an experiment

- Present results from an experiment

### **Tentative Course Schedule** (subject to change):

8:30 am weekdays	Lecture, check-in or reports
≈9:30 am to 5:30 pm every day	Laboratory and preparatory work as per your experimental plan, grab lunch in between. Some days (to be announced) field sampling
7:30 pm weekdays	Lecture, check-in or reports

Generally, we start and end each weekday with a meeting. Sometimes I will lecture, other days we will informally check in with each group, and some days you will report formally (meaning you are graded). See the schedule posted for details. During the day you will be busy designing, preparing, conducting and interpreting your experiment. Whereas there are no formal lectures on Saturday and Sunday, the laboratory work will continue daily on your own schedule (lab open: 9:30am to 5:30pm). You will be working in teams of about 4 people per team testing a total of 4 different hypotheses (16 students). This means each team will do something different. Although your focus is on your own team/ experiment, it is important that you also understand what the other groups are doing. Talk to each other and teach each other. You may be asked about the other projects.

### **Text books:**

None. Material for the course such as links to websites, scientific articles, manuals for equipment, protocols etc. will be accessible via the Brightspace course shell.

### **Prerequisites:**

Science 1807 & 1808;  
BIOL 2600 or 3710 or 3 OCSC 2000 level courses

### **Evaluation** (subject to change)

1. Presentation of Experimental Plan: 8% - PowerPoint Report: Orally and post on D2L, *one per team*
2. *De facto* Experimental Design: 7% - Adapted PowerPoint of Experimental Plan: post on D2L *one per team*
3. Lab Protocols: 15% - spot checks ongoing, final turn-in hard copy at end, *individual*
4. Final data sheets with results: 10% - post in D2L at end, *individual*
5. Literature Report: 15% - PowerPoint Presentation of Background of each team's topic (4-5 papers) – presentation and post on D2L, *one per team*.
6. Quizzes on lecture material: 10%, *individual*
7. Participation and engagement: 10%, *individual*
8. Final Poster: 25% - Present last day, post final poster a week later after implementing change suggestions, *one per team*.

Participation: Students are expected to participate actively in all aspects of the course. Every student is assessed continuously throughout the course on his/her level of involvement, from attendance of meetings and lectures, to the sharing of ideas and opinions during discussions, to the general attitude and level of preparation before and during activities, to laboratory safety and clean up. Timely completion/submission of each deliverable and overall course assignments will also be considered.

Lab/Field book: Each student must purchase a notebook (Lab/Field book) to keep a permanent record of her/his work on all aspects of the course. Each student is expected to maintain detailed, accurate, and legible notes of their own work that can be understood by the course instructor and teaching assistant. Work conducted by team members should just to referred to but not included. The notebook is assessed informally during the course, and turned in for a final grade at the end. The content of the notebook is instrumental in preparing the final report.

Presentations: Experimental Plan, Literature Report, Final Poster Presentation are all given as oral team presentations. The Power Point of the Experimental Plan and the Literature report are turned in right away after presentation. An adapted version of the Experimental Plan, showing the *de facto* Experimental Design is turned in later. The Final Poster can also be turned in after the course ends, to allow implementing suggested changes. Both the presentation of the Poster, and the final Poster will be evaluated. Each Power Point presentation should include an accreditation of each student's contributions.

Data sheets: Students will be required to submit their excel data sheets, including all collected data, QC and graphics used to prepare the Poster. These data sheets will include data from the whole team, but QC and interpretation, graphics are done individually.

**Suggested strategy to do well in this course:**

- 1) Think safety first. The foremost consideration for any course with a field component is **SAFETY**. Do not let the manipulation of instruments or collection of data override the safety aspect of your work. If you are concerned for your safety, do not hesitate to discuss it immediately with the course instructor. Remind your fellow students if you see them doing something unsafe.
- 2) Bring proper protective clothing: sandals, shorts, tank-tops etc. have NO place in the lab or on a boat! Long hair should be tied back. Also bring appropriate (different) clothes to go out on a boat, where you might get wet, where it might be windy and cold.
- 3) Scientific equipment is NOT plug and play. If you are unsure about how to use an instrument, PLEASE ask the TA or the instructor. Even small mistakes in the handling of equipment easily cost several thousand dollars. Most of this equipment is used by graduate students, and you do not want to ruin their thesis research. If something seems broken, please let us know immediately rather than trying to fix it. We often do know how to "fix it" without increasing the damage!
- 4) Show up on time and prepare. This course is loaded with interesting activities, which require working singly or collaboratively on tight schedules. If you are late, everyone will be. Follow all the instructions for preparation carefully. Instructors will begin their scheduled activities as per the times indicated.
- 5) Ask questions. If a question comes to mind, chances are that most classmates have the same question. Do not hesitate to ask for clarification. This class is meant to be interactive!
- 6) Seek help outside of daily schedules. Do not hesitate to ask the instructors or teaching assistant if you experience any difficulty that could not be addressed during normal daily schedules. We are

flexible and certainly willing to help you do well in the course! This is a great advantage of a course at a field station.

- 7) Use of personal laptop: Please bring your personal laptop to class and use it to take notes, analyze data, and prepare your written reports and oral presentation slideshow, research information etc. You should have word, excel, power point and pdf maker on your computer.

If you are worried about a specific concern, please talk to the instructor, TA or someone at the station.

### **Other Issues**

A statement of Memorial University of Newfoundland's commitment to accommodation of students with disabilities: Memorial University of Newfoundland is committed to supporting inclusive education based on the principles of equity, accessibility and collaboration. Accommodations are provided within the scope of the University Policies for the Accommodations for Students with Disabilities ([www.mun.ca/policy/site/policy.php?id=323](http://www.mun.ca/policy/site/policy.php?id=323)). Students who may need an academic accommodation are asked to initiate the request with the Glenn Roy Blundon Centre at the earliest opportunity ([www.mun.ca/blundon](http://www.mun.ca/blundon)).

A statement regarding academic integrity, including a reference to the entry on Academic Misconduct (University Regulation 6.12): Students are expected to adhere to those principles which constitute proper academic conduct. A student has the responsibility to know which actions, as described under Academic Offences in the University Regulations, could be construed as dishonest or improper. Students found guilty of an academic offence may be subject to a number of penalties commensurate with the offence including reprimand, reduction of grade, probation, suspension or expulsion from the University. For more information regarding this policy, students should refer to the University Regulations for Academic Misconduct (Section 6.12) in the University Calendar.

As outlined in Section 4.12.4 of MUN's Calendar, plagiarism (the act of presenting the ideas or works of another as one's own) is a form of academic offence. Plagiarism will not be tolerated in this course. Any student who plagiarizes another's work exposes himself/herself to the disciplinary measures outlined in section 4.12 of MUN's Calendar, including course expulsion. We will provide guidelines on how to avoid this problem on the first day of class.

The lectures and displays (and all material) delivered or provided by the course instructors, including any visual or audio recording thereof, are subject to copyright owned by the course instructor. It is prohibited to record or copy by any means, in any format, openly or surreptitiously, in whole or in part, in the absence of express written permission from the course instructors any of the lectures or materials provided or published in any form during or from the course.

### **Student Supports and Services:**

*The Writing Centre:*

<https://www.mun.ca/writingcentre/>

*Center for Innovation in Teaching and Learning:*

<https://www.citl.mun.ca/>

*Information Technology Services:*

<https://www.mun.ca/cio/itservices/index.php>

*Student Wellness and Counselling Centre:*

<https://www.mun.ca/studentwellness/>