

Marine Ecology Biol 3761/Mari 3761 Fall term

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Lectures: LSC 332; MWF: 10:35-11:25

Tutorials: LSC 334; M: 11:35-12:25 (5 tutorials on field project)

Syllabus

Module 1: Life on land and in the sea: worlds of contrast

Physical/chemical environment, suspension, swimming; filter feeding
Light, sound, & pressure; ecosystem structure & function

Module 2: The rocky intertidal zone: a test bed for ecological theory

Environment, zonation
Competition & predation
Tutorial 1: Field project design
Biological & physical factors; seaweeds & grazing
Patchiness, succession, disturbance, latitudinal gradients
FIELD TRIP: Sandy Cove, Sambro
Vignette: intertidal adaptations - brittle stars, limpets
Tutorial 2: Field data collation & image analysis; data presentation

Module 3: Reproduction, larval ecology, & recruitment

Asexual & sexual reproduction, fertilization rate
Larval developmental strategies, mortality
Dispersal, larval behaviour, settlement, recruitment
Tutorial 3: Field data interpretation
Vignette: fertilization ecology of free-spawners, coral mass spawning
FIELD REPORT: Data entry complete

Module 4: The rocky subtidal zone: a hot bed of biological interactions

Habitats, biological & physical factors, hydrodynamics
Kelp beds/forests: distributional patterns, productivity
FIELD REPORT: Draft 1 figures due
Grazing, predation, disturbance
Group presentation 1
Urchin-kelp interactions, trophic cascades
FIELD REPORT: Draft 1 figures due

Group presentation 2
Vignette: Alternative states of the rocky subtidal zone
Tutorial 4: Scientific writing
Vignette: Species invasions in kelp beds
Group presentation 3
MIDTERM EXAM (No tutorial)

Module 5: Tropical coral reefs: Oases in a desert ocean

Reef distribution, origin & structure, biological assemblages
Group presentation 4
Coral biology & algal symbiosis
FIELD REPORT DUE
Coral productivity, species interactions, disturbance
Group presentation 5
REMEMBRANCE DAY HOLIDAY
Human impacts, climate change and the fate of reefs
Group presentation 6
Vignettes: Coral bleaching; fish predation on reefs

Module 6: The deep: mountains, plains & hot springs

Environment, patterns of abundance & diversity
Adaptations, symbioses, biological processes
Hydrothermal vents

Course review

Course review, exam preparation, class evaluation

Suggested Text

Nybakken JW and Bertness MD (2004) Marine Biology: An Ecological Approach. 6th Edition. Benjamin Cummings, San Francisco

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Evaluation

Oral presentation:	5 %
Field trip report	25 %
Midterm exam	25 %
Final exam	45 %

Numerical grades (to nearest integer) will be converted to letter grades:

90-100	A+
85-89	A
80-84	A-
75-79	B+
70-74	B
65-69	B-
60-64	C+
55-59	C
50-54	C-
45-49	D
<45	F

University policy on plagiarism and cheating will be strictly enforced.

Medical notes are required for missed exams.

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests and exams should make their request to the Advising and Access Services Center (AASC) prior to or at the outset of the regular academic year. Please visit www.dal.ca/access for more information and to obtain the Request for Accommodation -- Form A.

A note taker may be required as part of a student's accommodation. There is an honorarium of \$75/course/term (with some exceptions). If you are interested, please contact AASC at 494-2836 for more information.

Please note that your classroom may contain specialized accessible furniture and equipment. It is important that these items remain in the classroom, untouched, so that students who require their usage will be able to participate in the class. Students with disabilities are encouraged to register as quickly as possible at the Student Accessibility Services if they want to receive academic accommodations.

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Group presentations:

- 3 students per group: 12 min PowerPoint presentation + 3 min question period per group. All members must present ~ 4 min each.
- Topics must be related to human exploitation of, and/or impacts to, marine organisms, populations or ecosystems.
- Team membership will be assigned
- Topics must be selected and a brief outline submitted by each group
- Order of topics will be decided by the Instructor by Sept 26 (3 groups/topics per class for 6 classes)
- Evaluation (per student): Information content and connection with group topic (2 marks); Presentation: quality of slides, organization, oral presentation (2 marks); Length (conformation to time limit) and response to questions (1 mark). Total: 5% of final grade.

Suggested topics (issues):

1. Fishing: overexploitation, effects on trophic structure & diversity, etc.
2. Fisheries management: stock assessment, strategies (MSY), modeling, etc
3. Marine mammal exploitation: management, effects on community structure, etc.
4. Bottom trawling: disturbance & impacts
5. Mariculture: cage culture, sea ranching, diseases, genetic manipulation, etc.
6. Pollution: oil & gas, chemical & radioactive wastes, thermal effluent, sewage, etc.
7. Eutrophication: nutrient inputs, fertilizers, disease, harmful algal blooms, etc.
8. Global warming: sea level rise, ice melt, species range shifts, ocean acidity, etc.
9. Biological invasions: vectors, effects on biodiversity, economic impacts, etc
10. Oil or mineral extraction: biological impacts, remediation strategies, etc.
11. Marine conservation: threatened & endangered species, marine protected areas, etc.
12. Marine biotechnology: feed production, growth enhancers, genetic methodologies
13. Coastal development: habitat alteration, loss & fragmentation, sedimentation, etc.
14. Ecotourism: coral reefs, whale watching, etc
15. Synergistic effects of multiple impacts

Other topics related to human exploitation and/or impacts in marine systems must be approved by the instructor. The primary aim is to discuss the ecology of human impacts, rather than social, political or economic issues.