

Faculty of Science Course Syllabus
Department of Oceanography
OCEA 4160.03 OCEA 5160.03, BIOL 4369.03 MARI 4369.03
Fisheries Oceanography
Winter 2017

Instructor(s): C.T. Taggart chris.taggart@dal.ca OCEA 4664 LSC

Lectures: 3 hrs/week, **Tue, Thu, 0835-0955 Studley, LSC-OCEANOGRAPHY Rm 3655**

Laboratories: N/A

Tutorials: 5 @ 1.5 hr each

- Office hours (Taggart): generally 14:30-16:00 Mon, Wed, Fri. Best to arrange ahead by email.
- TA Office hours <hansen.johnson@dal.ca>: To be determined: Best to arrange ahead by email.
- Email correspondence requires Dalhousie email account

Course Description

Oceanographic influences on ecology of marine fish: on population dynamics, distribution, abundance, reproduction, life history, feeding, growth, metabolism, mortality, and recruitment. Emphasis is on contemporary hypotheses and primary literature and some on fishery management. Primary-publication-style research paper required. Competence with fundamental population dynamics, ecology, physical oceanography, mathematics, and statistical analyses expected.

Course Prerequisites: *PREREQUISITES: OCEA 2000.06 or 2001.03 or 2002.03, BIOL 2060.03 and/or 3067.03 or equivalent. MATH/STAT 1060.03 and/or 2080.03 or equivalent or instructor's consent.*

Course Objectives/Learning Outcomes

Students who are not comfortable with the fundamentals of population dynamics, ecology, physical oceanography, calculus, statistics, and computerized analysis should carefully consider enrolling. The course focuses on the ecology of marine fish (including significant advances made in freshwater systems) from an oceanographic perspective and on the biotic and abiotic influences on marine fish population dynamics and production, distribution and abundance. Lectures include reproduction, early life history, feeding, growth, metabolism, mortality, and recruitment variability and forecasting. Emphasis is placed on: 1) the hydrological and meteorological processes influencing the above; and on 2) the primary literature, current problems and hypotheses, and fruitful research directions, approaches and techniques. Some emphasis is also placed on the application of scientific insights to fishery management techniques. Students are required to write a primary publication-style research paper.

Objectives:

- *Provide conceptual framework*
- *Identify scientific problems and possible solutions*
- *Consider various approaches*
- *Identify and assess hypotheses and tests*
- *Improve thinking and problem solving abilities*
- *Provide useful skills*
- *Improve on your scientifically critical mind*
- *Prepare you for graduate school or development therein*
- *Develop scientific communication skills*

List of knowledge/skills student should have after completing course:

- *Aptitude for diagnosing stock collapse and consideration of consequences*
- *Aptitude for estimating mortality rates and external influences thereon*
- *Aptitude for estimating stock-recruitment relations from first principles and fitting models*
- *Aptitude in addressing fisheries hypotheses via literature-based scavenging and analyses*
- *Aptitude in diagnosing size-selective fishing effects on populations*
- *Aptitude for quantifying relations between and among population and recruitment metrics*
- *Aptitude in quantifying fundamental components of stock biomass variation*
- *Competency in the use of fundamental and ectothermic fish-growth models*
- *Competency in use of fundamental scientific measurements and statistical parameters*
- *Competency in applied fundamental time-spaces series analysis of ecological data*
- *Competency in fundamental stock and recruitment terms, metrics and units*
- *Competency with the elements of writing a scientific manuscript and making a research presentation*
- *Enhanced quantitative familiarization with state of global fisheries and exploitation*
- *Familiar with cohort, virtual and sequential population analyses*
- *Familiar with early life history and relations among time, abundance, size, and stage duration*
- *Familiar with early life history and water column turbulence on predator prey relations*
- *Familiar with fundamental recruitment hypotheses and explanatory variables*
- *Familiar with life-history closure leading to stock and recruitment concepts and models*
- *Familiar with research survey protocols, assumptions, measures and limitations*
- *Familiar with the contemporary literature on size-selective fishing*
- *Familiar with the literature on industrially-driven fishery collapses*
- *Familiar with qualitative nature of renewable marine fishery resources*
- *Familiar with the scientific epistemology and the 'doing' of science*

Course Materials

Textbook and/or other: *Library Reserve and relevant chapter PDF copies as follows:*

- *Stats-handbook: \$3 print-recovery-cost*
- *Rothschild, Brian J. 1986. Dynamics of marine fish populations. QL 620 R68*
- *Cushing, D. H. 1995. Population production and regulation in the sea: a fisheries perspective. QL 618.3 C875 1995*
- *Legendre and Legendre. 1998. Numerical ecology. QH 541.15 M34 L4313 1998*
- *Legendre and Legendre. 1983. Numerical ecology. QH 541.15 M34 L4313 1983*
- *Ricker, William Edwin. 1975. Computation and interpretation of biological statistics of fish populations. SH 223 A1 no.191.*

Course website: “BBlearn”

Course Assessment

Component	Weight (% of final grade)	Date
Tests/quizzes		
<i>EB Quiz</i>	10±3%	<i>late Jan</i>
<i>Midterm</i>	15±5%	<i>mid Feb</i>
<i>Final exam</i>	23±5%	<i>(Scheduled by Registrar)</i>
Assignments		
<i>Tutorial 01</i>	5.75±2%	<i>late Jan</i>
<i>Tutorial 02</i>	5.75±2%	<i>mid Feb</i>
<i>Tutorial 03</i>	5.75±2%	<i>early Mar</i>
<i>Tutorial 04</i>	5.75±2%	<i>late Mar</i>

Other course requirements

<i>Participation: each class</i>	5±2%	<i>term</i>
<i>Research paper presentation</i>	4±2%	<i>last class(es)</i>
<i>Research paper</i>	20±5%	<i>end of exam period</i>

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

Course Policies

Late assignment: -20% per day compounded

Missed assignments or exams: zero grade unless otherwise arranged or justifiably accommodated

Weather-related cancelled classes, etc.: accommodated by adjusting lectures/schedules.

Course Content

List of lecture topics

Guest lectures by PhDs or PDFs in my lab – “this is what one does in grad school”

ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the ***Request for Accommodation*** form are available at www.dal.ca/access.

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's ***Policy on Intellectual Honesty*** and ***Faculty Discipline Procedures*** is available here:

http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

"The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members."

The full text of the code can be found here:

http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Service	Support Provided	Location	Contact
General Academic Advising	Help with <ul style="list-style-type: none"> - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties 	Killam Library Ground floor Rm G28 Bissett Centre for Academic Success	In person: Killam Library Rm G28 By appointment: <ul style="list-style-type: none"> - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal
Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	Killam Library Ground floor Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	Killam Library 3rd floor Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: <ul style="list-style-type: none"> - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours All information can be found on our website: www.dal.ca/sfs
Writing Centre	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) <ul style="list-style-type: none"> - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field 	Killam Library Ground floor Learning Commons & Rm G25	To make an appointment: <ul style="list-style-type: none"> - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal We are open six days a week See our website: writingcentre.dal.ca