

BIOL 461/561: Fisheries Ecology and Management

Lecture: Mon-Thurs 2:30-3:50— MAC D103

Tutorial: Thurs 4:00-4:50— MAC D103

Grad student tutorial: Mon 4:00-4:50— MAC D103

FALL 2024 (CRN: 10408/9, 10420/1)

Objectives: To examine the principles of fisheries science from the basic biology of individuals to dynamic processes of populations, whole fisheries, and how mathematical models are derived to predict changes in fisheries for management purposes.

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Texts: Required: Jennings, S., M.J. Kaiser, and J.D. Reynolds. 2001. *Marine Fisheries Ecology*. Blackwell Science Ltd. Oxford, UK. 417pp. **Now available as an ebook in the library**

Recommended: King, M. 2007. *Fisheries Biology, Assessment, and Management*. Blackwell Science Ltd. (any edition); Gotelli, NJ. *A primer of Ecology*, Sinauer (any edition),

Grading:	3 Exams	each exam 10% of grade
	Exercises	30%
	Paper	20%
	Presentation	10%
	Peer review	5%
	Attendance/Participation	5%

Grading Policy: You are expected to attend all lecture and tutorial sessions. Lectures will not be recorded. All homework exercises (including reading presentations) must be handed in by 2:30 pm on the due date. Late assignments will incur a 20% penalty during the first 7 days past the due date. No assignments will be accepted more than 7 days past the due date.

Exams: Exams will be held during class time. Any makeup exams will be ORAL exams honoured only with the accompaniment of a medical/personal emergency excuse.

Exercises: There will be a series (5-7) exercises due approximately biweekly, delivered and submitted through brightspace.

Paper: A brief summary of the fisheries biology and management of a (marine) species of your choice. A handout outlining appropriate literature and paper format will be distributed in class. For library research help, see our course library guide, <http://libguides.uvic.ca/FisheriesEcology>

Species choice and 5 references: Due October 17

Final: Due November 18

Length: 5-7 pages (Double-spaced, 12 point font, 1 inch margins)

Presentations: Students will deliver a live oral presentation on species papers during the last day of classes (December 2) or the study break (December 5-6). Graduate students will lead book review and present oral and written summaries of assigned chapters, and work on a data project.

Grading scale (GPA): A+=90-100 (9); A=85-89 (8); A-=80-84 (7); B+=77-79 (6); B=73-76 (5); B-=70-72 (4); C+=65-69 (3); C=60-64 (2); D=50-59 (1); F=<50 (0).

Course Outline

Part 1. Introduction

Basic definitions

Marine Fisheries Management:

Current Issues	
Objectives and goals	Chapter 1, 17
Marine ecology and production	Chapter 2
Fishery Resources	Chapter 3
Fishing Gear and Methods	Chapter 5
History of Fisheries	
Aquaculture production	
Fisheries today: wild vs aquaculture	
Global	
Canada	

EXAM 1--OCTOBER 7

Species choice and references due **OCTOBER 17**

Part 2. Population dynamics

Chapters 4, 9

Age and Growth
Density-independent mortality
Density-dependent mortality
Reproduction
Recruitment
Stock-recruitment models
Age-structured models

EXAM 2--OCTOBER 31

Part 3. Fishery processes

Chapters 7, 8

Surplus production models
Dynamic Pool models (Yield per recruit)
Cohort models (Virtual Population analysis)
Management tactics and strategies
Socio- and Bio-economic models Chapters 6, 11
Conservation issues Chapters 13-16

Papers due on **NOVEMBER 18**

Oral Presentations due on **DECEMBER 1**

Peer reviews due on **DECEMBER 2**

EXAM 3—NOVEMBER 28

Part 4. Student presentations (a mini-symposium on Dec 2)

NOTE, Monday September 30, October 14, and November 11 are all holidays.

Course description and learning outcomes

Lectures are where most of the course content will be delivered, with lecture notes available on brightspace before the lecture is delivered. This is also where any updates on course material, deadlines, seminars of interest, etc. will be announced. I will also briefly summarize the previous lecture's highlights at the beginning of a lecture. These summaries will not be posted.

Exercises are intended to develop analytical skills by applying course information to practical questions about age and growth, mortality, life tables, etc. We will use EXCEL for all computations. For most exercises, we will go over results in tutorial on days they are due. Students can choose to upload revised responses for a small increase in grades (~10%). Exercises also include a fish market visit review, paper reviews and 2-3 fisheries film reviews. These are intended to give students a better sense of the human dimensions side of fisheries. I will provide a specific format for the fish size data collection and market reviews, and specific questions for paper and film reviews.

Tutorials will serve various purposes including further discussion/clarification of lecture material, detailed overview of exercises, and discussions with outside speakers. The speakers will include an ONC scientist who will introduce and help learners collect data for the age/growth exercise, scientists from Archipelago Marine Research who will talk about electronic monitoring of BC fisheries, a scientist from the Buck Suzuki Foundation along with an indigenous fisher who will provide an indigenous perspective on a selected BC fishery, presentations about selected fishery science projects from Juanes lab graduate students, and a talk on how to best give an oral presentation.

Exams (3-4 pages, mainly short answers) will test knowledge of lecture material (and reading) with some questions from tutorial sessions included. There will no math calculations in exams.

Final paper will develop writing skills and allow students to synthesize course material by focusing on the biology, fishery status, fishing methodology and management of a (marine) species of their choice.

Final oral presentation is intended to develop oral presentation skills. Students will summarize their written papers in 7 minutes and answer questions from the audience. Students will also evaluate each other through an anonymous peer review. We will devote a tutorial towards outlining useful presentation skills. Students whose accommodation state they can't give presentations, will be asked to record a presentation on zoom which will be shown at the year-end symposium.

Completion requirements.

A grade >50% is needed for completion. Students who miss substantial amounts of class and assignments without documentation will be asked to withdraw, as they will receive an N at the end of the term.

Intended Learning Outcomes

In this course students will learn about multiple aspects of fisheries science, from an ecological and management perspective. In Part 1, we will focus on providing a historical background as well as outlining harvest methods, commonly harvested species, and the state of fisheries globally, in Canada and in BC. In Part 2, we will focus on learning core concepts in population biology and ecology such as age/growth, reproduction, recruitment, and mortality. In Part 3, we will apply these core courses into management models primarily for single species, but with a brief introduction to multispecies and ecosystem management. Students will develop core competencies in the ability to: apply the process of science to management, use quantitative reasoning, basic population modeling, incorporate multidisciplinary aspects of fisheries, communicate your understanding thru exams, exercises, a paper and oral presentation, and ultimately understand relationship between fisheries science and society. Specific skills will include: following detailed instructions, assessing and summarizing scientific information, make measurements from video footage, record and summarize collected data, basic statistical analysis, data visualization, data interpretation, mathematical problem solving, written and oral communication.

Academic honesty

Students will be expected to adhere to the UVic Policy on Academic Integrity standards (<https://www.uvic.ca/students/academics/academic-integrity/index.php>). You may discuss how to solve homework assignments together, but are expected to compute and write your results separately.

Withdrawals and Deferrals

Students are to familiarize themselves with the withdrawal dates in the academic calendar (<https://www.uvic.ca/calendar/dates/>).

Accessibility Statement

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (<https://www.uvic.ca/accessible-learning/index.php>) as soon as possible. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

A Note on Plagiarism

Actions such as plagiarism, multiple submissions, falsifying materials used in academic evaluations, cheating, aiding others to cheat, or unauthorized use of an editor violate University policies on academic integrity and are considered serious offences. You must inform yourself about the university regulations (see UVic Policy on Academic Integrity; [see link above](#)).

Unauthorized Use of an Editor

An editor is an individual or service, other than the instructor or supervisory committee, who manipulates, revises, corrects or alters a student's written or non-written work (including the use of AI tools). The use of an editor, whether paid or unpaid, is prohibited unless the instructor grants explicit written authorization. If you have questions, please ask.

University Policy on Human Rights, Equity, and Fairness

According to the Policy on Human Rights, Equity, and Fairness

(https://www.uvic.ca/universitysecretary/assets/docs/policies/GV0200_1105_.pdf), the “University promotes a safe, respectful and supportive learning and working environment for all members of the university community. The University fosters an environment characterized by fairness, openness, equity, and respect for the dignity and diversity of its members. The University strives to be a place that is free of discrimination and harassment, injustice and violence. The strength and vibrancy of the University is found in the diverse life experiences, backgrounds and worldviews of all its members.”

Classroom Conduct and Course Responsibilities

With regard to the learning environment, the University Calendar’s Policy on Creating a Respectful and Positive Learning Environment states that UVic “is committed to promoting critical academic discourse while providing a respectful and productive learning environment. All members of the university community have the right to experience, and the responsibility to help create, such an environment. In any course, the instructor has the primary responsibility for creating a respectful and productive learning environment in a manner consistent with other university policies and regulations.”

In terms of expectations for students, the University Calendar’s Attendance Policy states that “[a]n instructor may refuse a student admission to a lecture, laboratory, online course discussion or learning activity, tutorial or other learning activity set out in the course outline because of lateness, misconduct, inattention or failure to meet the responsibilities of the course set out in the course outline.”

Students engaging in misconduct or failing to meet their course responsibilities can expect a communication from the instructor that outlines the concerning behaviour, explains how such behaviour is disrupting the learning environment, and requests that the student refrain from further disruptive behaviour. Should such instances of misconduct continue, the student will receive a formal request to meet with the Department Chair in order to seek remediation between the parties. If necessary, further procedures to resolve the situation can be found in the Policy on Resolution of Non-Academic Misconduct Allegations (<https://www.uvic.ca/services/studentlife/student-conduct/non-academic-misconduct/index.php>).

Please keep in mind the overlapping policy on [Online Student Conduct](#) specifies standards of behaviour in the online environment.

****Territory Acknowledgement****

We acknowledge with respect the Lkwungen-speaking peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.