



*We acknowledge and respect the Ləkʷəŋən (Songhees and Esquimalt) Peoples on whose territory the university stands, and the Ləkʷəŋən and W̱SÁNEĆ Peoples whose historical relationships with the land continue to this day.*

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## COURSE OUTLINE

### BIOLOGICAL OCEANOGRAPHY

Lecture: CLE A127, Mon & Thu 1:00-2:20pm (in person)

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**PREREQUISITES:** One of CHEM 101 or 150; CHEM 102; Two of MATH 100, 101, 102, 109, 151; One of PHYS 102, 102A & 102B, 110 & 111, 112, or 120 & 130. Minimum third-year standing.

#### CONTACT INFO:

Instructor:	Dr. John Dower	<a href="mailto:dower@uvic.ca">dower@uvic.ca</a>
Office:	Bob Wright Centre A327	
Office Hours:	By appointment	
Senior Lab Instructor:	Eva MacLennan Bob Wright Centre B111	<a href="mailto:evameagn@uvic.ca">evameagn@uvic.ca</a>
Teaching Assistants:	Nic Ens El Hobson Ashleigh Mickens Matt Miller	<a href="mailto:nens@uvic.ca">nens@uvic.ca</a> <a href="mailto:eleanorh@uvic.ca">eleanorh@uvic.ca</a> <a href="mailto:amickens@uvic.ca">amickens@uvic.ca</a> <a href="mailto:mattmiller@uvic.ca">mattmiller@uvic.ca</a>

#### COURSE DESCRIPTION

An introduction to the ways in which physical, chemical and biological processes interact to regulate structure and productivity of marine ecosystems. Lectures focus primarily on planktonic ecosystems. Participation in a one-day oceanographic cruise is required.

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#### LEARNING OUTCOMES

By the end of this course you will understand and be able to explain the factors that drive variability in biological production in different regions of the ocean, and at different times of the year. You will also understand the distinguishing characteristics and ecological roles played by the “key players” in marine food webs.

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#### COURSE MATERIALS

**Textbook: None**

**Lab Manual:** Fall 2024 edition required. Purchase from UVic bookstore.

**Other materials:** Lab coats, safety glasses, long pants, and close-toed shoes are required when specific chemical analyses are listed in the schedule.

**Class recordings:** Classroom sessions in this course will be recorded to allow students who are ill to watch later. These recordings will be made available on a case-by-case basis during the term and to everyone just before exams. Students who have questions or concerns regarding class recording and privacy may contact [privacyinfo@uvic.ca](mailto:privacyinfo@uvic.ca). Auto-generated captioning is enabled for recordings in this course. Automated captioning is not 100% accurate, however, and may therefore include errors depending on the subject matter, speaker, audio quality, etc. If you find captioning that is offensive, please make your instructor aware.

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## BRIGHTSPACE

<https://bright.uvic.ca/> "Fall 2024 BIOL & EOS 311 A01 X"

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## EVALUATION

**Marking Scheme:** No supplemental examinations or additional course work for extra marks are offered in this course.

**Classroom Component (60%):**

In-class Discussion Participation (Echo360)	5%
Midterm Exam (in class, Oct 17)	18%
Final Course Exam (date TBA)	37%

**Laboratory Component (40%):**

In-lab exercises	20%
Strickland Cruise Report Assignments	
<i>Introduction</i>	3%
<i>Figures, Tables, and Captions</i>	3%
<i>Final Report (Results &amp; Discussion)</i>	14%

**Final Course Mark**

**100%**

**Essential Course Requirements:** *At minimum, you must complete the final exam and all three parts of the Strickland Cruise Report to pass the course. Students must also achieve a passing grade ( $\geq 50\%$ ) in both the lecture component and the laboratory component to pass the course. Students who do not complete at least these requirements will be assigned an N in the course and a maximum grade of 49%.*

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## COURSE POLICIES

### POLICY: CLASS CONDUCT

**Classroom:** This course will be primarily taught in-person. Classroom sessions will typically consist of lectures combined with activities/exercises designed to promote a deeper understanding. Discussions and exercises will take place in small groups. Groups will occasionally be asked to present the conclusions of their discussions to the rest of the class.

**Laboratories:** The laboratory component of this course will be devoted to our class project on Saanich Inlet. **In-person labs begin on Tuesday September 10<sup>th</sup>** and will be held in Bob Wright Centre (BWC) B118 unless otherwise specified.

Most lab sections are full, so unless you have previous permission from Eva, you can only attend the section in which you are registered. Further information about laboratory policies and procedures can be found in the Lab Manual.

**Field Trips:** A series of one-day research cruises on UVic's research vessel, the *R/V John Strickland* are scheduled for **September 19-28<sup>th</sup>**. Each student is expected to participate for one day on the ship. Data collected will form the basis for subsequent laboratory analyses and assignments. More information on the *Strickland* trips and lab exercises will be provided in the lab manual and during lectures and labs. Lab assignments consist of a combination of in-lab assignments and a series of three longer assignments associated with the *Strickland* dataset. In-lab exercises are due at the end of the associated lab period.



**Lab Manual:** The printed lab manual contains the background and analytical procedures for successful completion of the pre-lab quizzes and lab activities. Instructions for Lab 1, the *Strickland* Cruise Report Assignments, and other materials will also be posted on Brightspace.

**Readings:** Short required readings may be posted in advance of some classes to provide background information for the discussions that will take place in class. Otherwise, we are not using a textbook in this course. However, if you feel that a textbook may be useful to you, we can suggest two that cover much of the same material as this course.

1) *Biological Oceanography – An Introduction* (2<sup>nd</sup> edition) by C.M. Lalli & T.R. Parsons (1997). This book is freely available online through the UVic library.

2) *Biological Oceanography* (2<sup>nd</sup> edition) by C.B. Miller and P. Wheeler (2012)

#### **POLICY: LATE/MISSED ASSIGNMENTS OR EXAMINATIONS**

All assignments, exams, and reports in BIOL/EOS 311 must be completed individually. You are not permitted to share your work with others. Please also refer to the section below on Academic Integrity.

If other commitments or circumstances arise that will prevent you from meeting a due date, contact Dr. Dower at least 24 hours before the due date to discuss a possible accommodation. Otherwise, late work will be assessed a penalty of 10% per day unless illness or a personal/family crisis has interfered.

The only acceptable reasons to miss an exam are illness, injury, personal crisis, or sporting commitments as a UVic athlete. Depending on circumstances, we may ask you to provide supporting documentation (e.g., a note from an official UVic coach). Students who miss the Midterm Exam for legitimate reasons will have the Final Exam count for 55% of their final grade. Personal travel plans are not a valid reason for missing the Midterm or the Final Exam, even if the plans were made and tickets purchased for you by family members without your knowledge. The date for the BIOL/EOS 311 Final Exam will not be known until the final exam schedule is posted in late October. The last day for final exams this semester is December 20<sup>th</sup>. You are safe to make travel arrangements for after that date. All requests for Deferred Status for the Final Exam must be made through the Office of the Registrar on a [Request for Academic Concession](#) form.

#### **POLICY: ATTENDANCE**

Unless ill, you are expected to attend all lectures in this course (and to receive your participation grade) and all of your laboratory sessions, unless you are unwell. If you need to miss a laboratory session, contact Eva ([evamegan@uvic.ca](mailto:evamegan@uvic.ca)) as

**soon as possible** – preferably in advance, but no later than one week after the missed lab section. If you miss a lab exercise without contacting Eva, you will receive a zero on that exercise.

#### **POLICY: ACADEMIC INTEGRITY**

It is every student's responsibility to be aware of UVic's [Policy on Academic Integrity](#), including policies on **cheating, plagiarism, unauthorized use of an editor, multiple submission, and aiding others to cheat**.

Students found to be cheating will receive a zero for their assignment and may receive a failing grade for the course. See also the UVic Ombudsperson's [publication on plagiarism](#). You may be surprised to learn all of the actions that are considered plagiarism and cheating.

If you have any questions or doubts, talk to me, your course instructor. For more information, see also [uvic.ca/learningandteaching/cac](http://uvic.ca/learningandteaching/cac).

#### **POLICY: USE OF AI**

Please be advised that in this course you are not authorized to use any form of generative AI. In order to successfully complete course activities, generative AI is not required nor welcomed. Students should not make any use of generative AI tools such as ChatGPT, Grammarly, among others that use AI for content generation and editing. As UVic states in its Academic Integrity Policy "*Academic integrity requires commitment to the values of honesty, trust, fairness, respect, and responsibility.*" Therefore, I expect you to comply with the course syllabus and I encourage you to enhance your academic experience in this course by refraining from use generative AI.

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### **COURSE FEEDBACK**

I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). **The survey is vital for providing feedback** to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. The survey is accessed online and can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

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## COURSE WEEKLY CALENDAR

UVic Important Dates - [uvic.ca/calendar/dates/](http://uvic.ca/calendar/dates/)

Last day to add courses: September 20<sup>th</sup>

Last day to drop a course without penalty of failure: October 31<sup>st</sup>

Date & Lecture Topic	LAB Activities
<b>Sep 05:</b> Course Intro, Biological Oceanography and the Abiotic Marine Environment	No labs this week
<b>Sep 09:</b> Key players in Marine Food Webs: Phytoplankton <b>Sep 12:</b> Key players Marine Food Webs: Zooplankton	Displaying oceanographic data and prep for <i>Strickland</i> trips
<b>Sep 16:</b> Anoxic/Hypoxic Basins and Oxygen Minimum Zones <b>Sep 19:</b> No lecture ( <i>Strickland</i> field trips)	No labs. <i>Strickland</i> field trips run from Sep 19 <sup>th</sup> -28 <sup>th</sup>
<b>Sep 23:</b> Key players: Microbes, Viruses, and the Microbial Loop <b>Sep 26:</b> No lecture ( <i>Strickland</i> field trips)	No labs. <i>Strickland</i> field trips run from Sep 19 <sup>th</sup> -28 <sup>th</sup>
<b>Sep 30:</b> National Day for Truth and Reconciliation - No Lecture <b>Oct 03:</b> Primary Production I – The role of light	Chlorophyll analysis (Appendix C)
<b>Oct 07:</b> Primary Production II – The role of nutrients <b>Oct 10:</b> Primary Production III – The role micronutrients & grazing	Phosphate analysis (Appendix A and B)
<b>Oct 14:</b> Thanksgiving – No Lecture <b>Oct 17:</b> Midterm Exam	Silicate analysis and Zooplankton biomass
<b>Oct 21:</b> Plankton Blooms and Patterns of Global Primary Production <b>Oct 24:</b> Regulation of Secondary Production	Nitrate Analysis
<b>Oct 28:</b> Upwelling Ecosystems <b>Oct 31:</b> Life at Low Reynolds Numbers	Zooplankton taxonomy and abundance
<b>Nov 04:</b> Larval Fish and Fisheries Oceanography <b>Nov 07:</b> Ecosystem Effects of Fishing	Ocean Data View Section Plot Tutorial (Brightspace)
<b>Nov 11:</b> Reading Week – No Lecture <b>Nov 14:</b> Marine Conservation	Reading Week - No Labs
<b>Nov 18:</b> Ocean Acidification <b>Nov 21:</b> TBA	Strickland Report Workshop 1
<b>Nov 25:</b> Atmosphere-Ocean Interactions with Marine Ecosystems <b>Nov 28:</b> Review Session	Strickland Report Workshop 2

### CHANGES DUE TO UNFORESEEN CIRCUMSTANCES

The above schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances. In the event of significant changes, a revised outline will be posted/circulated.

## APPENDIX

### SCHOOL OF EARTH AND OCEAN SCIENCES INFO

- SEOS Website: [uvic.ca/seos](http://uvic.ca/seos)
- SEOS Office: [seos@uvic.ca](mailto:seos@uvic.ca)
- SEOS Director: Dr. Jay Cullen, [seosdirector@uvic.ca](mailto:seosdirector@uvic.ca)
- SEOS Mental Health & Wellness Contact: Dr. Andy Fraass, [andyfraass@uvic.ca](mailto:andyfraass@uvic.ca)
- SEOS Undergraduate Advisor: Dr. Jon Husson, [seosadvisor@uvic.ca](mailto:seosadvisor@uvic.ca)
- SEOS Graduate Advisor: Dr. Roberta Hamme, [seosgradadvisor@uvic.ca](mailto:seosgradadvisor@uvic.ca)
- Ocean Science Mentor: Dr. Jody Klymak, [seosoceansci@uvic.ca](mailto:seosoceansci@uvic.ca)
- Climate Science Advisor: Dr. Colin Goldblatt, [climateadvising@uvic.ca](mailto:climateadvising@uvic.ca)

### UNIVERSITY STATEMENTS & POLICIES

- Academic Calendar: [Information for All Students](#)
- [Creating a respectful, inclusive, and productive learning environment](#)
- [Accommodation of Religious Observance](#)
- [Accommodation and Access for Students with Disabilities](#)
- [Student Conduct](#)
- [Non-academic Student Misconduct](#)
- [Accessibility](#)
- [Diversity / EDI](#)
- [Equity statement](#)
- [Sexualized Violence Prevention and Response](#)
- [Discrimination and Harassment Policy](#)

### UVIC GRADING SYSTEM

As per the Academic Calendar:

Grade	Grade point value	Grade scale	Description
<b>A+</b> <b>A</b> <b>A-</b>	9 8 7	90-100% 85-89% 80-84%	<b>Exceptional, outstanding</b> and <b>excellent</b> performance. Normally achieved by a minority of students. These grades indicate a student who is self-initiating, exceeds expectation and has an insightful grasp of the subject matter.
<b>B+</b> <b>B</b> <b>B-</b>	6 5 4	77-79% 73-76% 70-72%	<b>Very good, good</b> and <b>solid</b> performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area.
<b>C+</b> <b>C</b>	3 2	65-69% 60-64%	<b>Satisfactory, or minimally satisfactory.</b> These grades indicate a satisfactory performance and knowledge of the subject matter.
<b>D</b>	1	50-59%	<b>Marginal</b> Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.
<b>F</b>	0	0-49%	<b>Unsatisfactory</b> performance. Wrote final examination and completed course requirements; no supplemental.
<b>N</b>	0	0-49%	Did not write examination or complete course requirements by the end of term or session; no supplemental.

## STUDENT RESOURCES

### POSITIVITY AND SAFETY

The University of Victoria is committed to promoting, providing, and protecting a positive and safe learning and working environment for all its members.

[Student Groups & Resources](#)

### ACADEMIC RESOURCES

UVic Library - *UVic Library offers many services and resources for undergraduate and graduate students.*  
[uvic.ca/students/academics/library-services](http://uvic.ca/students/academics/library-services)

Learning Resources - *UVic Learn Anywhere is the primary learning resource for students that offers many learning workshops and resources to help students with academics and learning strategies.*  
[onlineacademiccommunity.uvic.ca/uviclearn](http://onlineacademiccommunity.uvic.ca/uviclearn)

Centre for Academic Communication - *Offers online and in-person one-on-one tutorials, workshops, and more.*  
[uvic.ca/learningandteaching/cac](http://uvic.ca/learningandteaching/cac)

Math & Stats Assistance Centre - *Offers drop-in, face-to-face tutoring and a friendly, collaborative study space for 100- and 200-level math and stats courses.*  
[uvic.ca/science/math-statistics/current-students/undergraduate/msac](http://uvic.ca/science/math-statistics/current-students/undergraduate/msac)

### MENTAL HEALTH & WELLNESS

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep, and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

SEOS Mental Health & Wellness Contact - *Dr. Fraass is a faculty member who can act as a sympathetic ear and (more importantly) provide guidance about: how to access the multitude of University support services, and which are useful in different circumstances. Andy can be found by dropping by his office or lab (Bob Wright A431, B409). He is also available via email for questions or to arrange a time to have a chat.* [andyfraass@uvic.ca](mailto:andyfraass@uvic.ca)

Student Wellness Centre - *Our team of practitioners offers a variety of services to support students' mental, physical, and spiritual health.* [uvic.ca/student-wellness](http://uvic.ca/student-wellness)

Counselling Services - *Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.* [uvic.ca/services/counselling/](http://uvic.ca/services/counselling/)

Health Services - *University Health Services (UHS) provides a full-service primary health clinic for students and coordinates healthy student and campus initiatives.* [uvic.ca/services/health/](http://uvic.ca/services/health/)

### ACCESSIBILITY

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a documented disability or health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible.

Centre for Accessible Learning - *The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.* [uvic.ca/services/cal/](http://uvic.ca/services/cal/)

### ADVISING

For academic advising-related questions, students in the School of Earth and Ocean Sciences are also encouraged to meet with the SEOS Undergraduate Advisor ([seosadvisor@uvic.ca](mailto:seosadvisor@uvic.ca)) as well as an academic advisor in the Academic Advising Centre early in their studies to help map out a plan to declare a major and complete university program requirements.

Academic Advising Centre - *Academic advice and support is currently available by phone, email and virtual or in-person appointments.* [uvic.ca/services/advising](http://uvic.ca/services/advising)

Ombudsperson - *The ombuds office is an independent, impartial, and confidential resource for undergraduate and graduate students and other members of the University of Victoria community. The ombudsperson helps resolve student problems or disputes fairly.* [uvicombudsperson.ca](http://uvicombudsperson.ca)

## **ACADEMIC CONCESSION**

You can request an academic concession if your course requirements are affected by unexpected and unavoidable circumstances, or conflicting responsibilities. Concession requests can be for an in-course extension, deferral, withdrawal under extenuating circumstances, or an aegrotat. Please speak to an advisor at the Academic Advising Centre if you have questions on how requesting a concession will affect your academic program.

Undergraduate Academic Concessions [uvic.ca/students/academics/academic-concessions-accommodations/request-for-academic-concession/index.php](http://uvic.ca/students/academics/academic-concessions-accommodations/request-for-academic-concession/index.php)

## **EQUITY AND HUMAN RIGHTS AT UVIC**

EQHR is a resource for students, staff, and faculty who have experienced sexualized violence, discrimination, and/or harassment and are looking for informal and/or formal resolution options as well as advice, coaching, and/or education. We are available for confidential consultations so that you can ask questions and learn your options.

EQHR – *By email at [eqhr01@uvic.ca](mailto:eqhr01@uvic.ca) or in-person (Sedgewick C115).* [uvic.ca/equity](http://uvic.ca/equity)

Sexualized Violence Resource Office – *If you have been directly or indirectly impacted by sexualized violence, reach out to the SVRO for information, advice, resolution options (restorative and disciplinary) as well as support options and referrals. The SVRO is both survivor-centred and trauma-informed in their approach. You can reach us by phone at [250-721-8021](tel:250-721-8021) or by email at [eqhr01@uvic.ca](mailto:eqhr01@uvic.ca) to book either an in-person (Sedgewick C119) or online appointment.* [uvic.ca/svp](http://uvic.ca/svp)

## **RESOURCES FOR INTERNATIONAL STUDENTS**

International Centre for Students - *The primary office supporting international students on campus at the university-wide level.* [uvic.ca/international-experiences](http://uvic.ca/international-experiences)

UVic Global Community Initiative - *Provides various supportive programming, including a Mentorship Program and Conversation Partner Program.* [uvic.ca/international-experiences/get-involved/uvic-global-community](http://uvic.ca/international-experiences/get-involved/uvic-global-community)

## **RESOURCES FOR INDIGENOUS STUDENTS**

Indigenous Student Support - *UVic offers holistic services to Indigenous students throughout their academic journey.* [uvic.ca/students/info-for/indigenous-students](http://uvic.ca/students/info-for/indigenous-students)

Elders in Residence - *The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty, and administration in Indigenous ways of knowing and being.* [uvic.ca/services/indigenous/students/programming/elders](http://uvic.ca/services/indigenous/students/programming/elders)