

Faculty of Science Course Syllabus (Section A) (revised April 2022)**Department of *Oceanography****OCEA/BIOL/MARI4370**Deep Sea Biology**Fall 2022*

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.

Instructor(s): *Anna Metaxas* metaxas@dal.ca *Office hours: arranged individually as requested*

Lectures: *MWF 9:35-10:25*

Laboratories: *N/A*

Tutorials: *N/A*

Course delivery: *In-person*

*Submit course syllabus to the Dean's Office (danielle.wood@dal.ca) and to your Department office for posting on the Dept website by **August 15 (fall term) or December 15 (winter term) or 2 weeks before the start of your course (summer term)**. If ready, earlier submissions are greatly appreciated.*

*Submit requests for final exam exemptions by **August 10 or December 10**. An exemption is required for 1000 to 3000 level courses if you are not planning to hold an exam in the scheduled final exam period. Submit your syllabus along with the **reason for the request** to the Assistant Dean (scieasst@dal.ca).*

The following information should be included, as a minimum, in every course syllabus.

Course Description

We focus on the biology of organisms inhabiting the deep sea: physiological adaptations to the physicochemical and geological environment; spatial and temporal distributions of biological assemblages; and regulatory factors of these assemblages, such as currents, food availability, reproduction and recruitment. Also, we delve into unique habitats, such as hydrothermal vent

Course Prerequisites

BIOL 2060.03 and OCEA 2000.06/OCEA2001.03 and OCEA2002.03

Course Exclusion

N/A

Learning Objectives

*Knowledge of the environmental conditions in the deep-sea and at chemosynthesis-based habitats
Ecosystem characteristics such as species composition and abundance, diversity, carbon flux
Knowledge of ecological processes such reproduction, dispersal, recruitment, competition and predation in the deep-sea
Measurement of spatial and temporal patterns in abundance*

Teamwork
Scientific presentations
Scientific writing
Assessment of the scientific literature

Course Materials

Notes and lecture slide shows provided on Brightspace, prepared by A. Metaxas
Scientific papers for group discussions and panel presentations (on Brightspace)
<https://dal.brightspace.com/d2l/home/232201>

For online/blended course delivery:

- N/A

Course Assessment

Assessment	Weight (% of final grade)	Date
1) A number of lectures will be given by AM or an invited speaker		
2) <u>Discussions</u> in 2 groups each with 15 students will focus on scientific papers or data obtained from scientific cruises and will be led by AM and TA. Students are expected to have read the papers in advance and participate in the Discussions		
3) <u>Panel presentations</u> will be led each by a group of 3 students. The group will receive guidance on the topics to be covered and a few initial readings. They are expected to augment the <u>literature</u> they will use to inform themselves on the topic. Non-members of the panel will be assigned a presenter and will ask <u>questions after the presentation</u> ; they will also have 24 h to post <u>written questions</u> to the on Brightspace, and the panel will have 36 hours after that to <u>respond in writing</u> also on Brightspace		
4) <u>A term paper</u> , 15-20 pages in length (double spaced, and excluding cover page, figures and cited literature) on a topic selected by the student in consultation with AM. A list of scientific papers from the <u>published literature</u> that will be used in the paper will be submitted in advance.		

Evaluation:

Class discussions (participation): 15%

Panels:

Presentation (10 min): 15%
 Oral response to questions: 5%
 Written response to questions: 10%
 Extra literature: 10%

Panel Questions:

Oral: 1%
 Written submissions: 4%

Term paper:

Literature/outline: 10% **Due: 31 Oct 2022 (5 pm ADT)**
 Paper: 30% **Due: 5 Dec 2022 (5 pm ADT)**

Other course requirements

N/A

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 on Missed or Late Academic Requirements

- Penalty for late submissions, 10% per day
- *Students are expected to use the Student Declaration of Absence form for late or missed requirements twice during the term.*

Course Policies related to Academic Integrity

Explain your policy on collaboration (for individual and group assignments or projects) – state explicitly whether students are allowed to work together on assignments.

Students are expected to work together to produce the panel presentations. A single grade will be assigned to all members within a panel.

Indicate if and how plagiarism software (e.g., URKUND) will be used in course.

URKUND will be used in cases where plagiarism is suspected

Course Content

		Part I: The deep-sea environment	
September	7	Introduction to the course	AM, MN
	9	Physical and chemical properties	AM
	12	The benthic boundary layer and the nepheloid layer	AM
	14	Vertical patterns in abundance	AM
	16	Library research skills	GM
	19	Vertical patterns in diversity	AM
	21	Seasonality, episodicity	
	23	Paper discussion	AM, MN
	26	Food resources	AM
	28	Energetics and metabolism	AM
	30	No class	AM, MN
October	3	PANEL: Deep-Sea Fisheries (growth, reproduction)	Students
	5	PANEL: The meso- and bathypelagic zones	Students
	7	Paper Discussion	AM, MN
	10	Thanksgiving – no class	
	12	PANEL: Climate change (seamounts)	Students
	14	Paper Discussion	AM, MN
	17	Larval biology, dispersal, recruitment	AM
	19	PANEL: Deep-sea mining (abyssal plains)	Students

21	Paper discussion	AM, MN
24	PANEL: Marine Litter	Students
26	PANEL: Marine Genetic Resources	Students
28	No class	

Part II: Hydrothermal vents and cold seeps: special habitats in the deep sea

	31	Geological formation, physical and chemical environment	AM
November	2	Energy flow, food webs	AM
	4	Paper discussion	AM, MN
	7-11	Study Break – no class	
	14	PANEL: Origins of life (physiological adaptations)	Students
	16	Spatial patterns in distribution	AM
	18	Paper discussion	AM, MN
	21	Temporal patterns of variability	AM
	23	Larval dispersal and recruitment	AM
	25	Paper discussion	AM, MN
	28	PANEL: Oil and gas (cold seeps)	Students
	30	PANEL: Designing MPAs in the deep sea	Students
December	2	PANEL: Research priorities in the deep sea	Students