



**University of Manitoba**  
**CHR Faculty of Environment, Earth and Resources**  
**Department of Environment and Geography**

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## COURSE DETAILS

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<b>Course Title &amp; Number:</b>	Biological Oceanography 1: Lower Trophic Levels, GEOG 3920 A01
<b>Number of Credit Hours:</b>	3
<b>Class Times &amp; Days of Week:</b>	To be determined
<b>Location for classes/labs/tutorials:</b>	582 Wallace Bldg.
<b>Pre-Requisites:</b>	A minimum grade of a "C" in both GEOG 2930 (previously 3770) Introduction to Oceanography and BIOL 1030 Biology II: Biological Diversity, Function & Interactions

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## Instructor Contact Information

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<b>Instructor(s) Name:</b>	Dr. C.J. Mundy
<b>Office Location:</b>	582 Wallace Bldg.
<b>Office Hours or Availability:</b>	Please email me or approach me at the end of a lecture to make an appointment.
<b>Office Phone No.</b>	204-272-1571
<b>Email:</b>	<a href="mailto:CJ.Mundy@umanitoba.ca">CJ.Mundy@umanitoba.ca</a> - I usually reply within 48 hours.

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### Course Description:

In this course, students will gain a background on the study of biological oceanography. Biological oceanography is a very active and important field of study worldwide due to the spatial coverage and biological activity of the world's oceans. This course examines the interaction of marine organisms with other biological life, as well as with the physical environment. Prerequisite: A minimum grade of "C" in both GEOG 2930 and BIOL 1030.

## General Course Information

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The ocean covers more than 70% of the Earth's surface, containing approximately 97% of our planet's water and 99% of its living space and more than 3.5 billion people depend on the

ocean for food; however, 90% of its realm remains to be explored. Thus, biological oceanography is a very active and important field of study worldwide. It examines the interaction of marine organisms with other organisms and their environment and therefore, ties closely to fields of biology and ecology. The course is highly interdisciplinary, touching on fields of physical and chemical oceanography and marine biology and ecology.

### **Course Goals**

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The major goal of this course is to provide students with a background on the study of biological oceanography. Additionally, students will work on assignments that will help develop presentation, critical thinking and writing skills.

### **Using Copyrighted Material**

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Please respect copyright. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University's Copyright Office website at <http://umanitoba.ca/copyright/> or contact [um\\_copyright@umanitoba.ca](mailto:um_copyright@umanitoba.ca).

### **Recording Class Lectures**

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Dr. C.J. Mundy and the University of Manitoba hold copyright over the course materials, presentations and lectures, which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission of Dr. Mundy. Course materials (both paper and digital) are for the participant's private study and research.

### **Textbook, Readings, Materials**

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Suggested textbook – Lali, C.M., and Parsons, T.R. 1997. *Biological Oceanography: An Introduction* (2nd Edition). Oxford: Elsevier Butterworth-Heinemann. 314 p

### **Course Technology**

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It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by Dr. Mundy and/or the University of Manitoba Student Accessibility Services. Student should not participate in personal direct electronic messaging / posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook) online and offline "gaming" during scheduled class time. If student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it. (©S Kondrashov. Used with permission)

## Class Communication

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The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit:

[http://umanitoba.ca/admin/governance/media/Electronic\\_Communication\\_with\\_Students\\_Policy\\_-\\_2014\\_06\\_05.pdf](http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2014_06_05.pdf)

Please note that all communication between myself and you as a student must comply with the electronic communication with student policy

([http://umanitoba.ca/admin/governance/governing\\_documents/community/electronic\\_communication\\_with\\_students\\_policy.html](http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html)). You are required to obtain and use your U of M email account for all communication between yourself and the university.

## Expectations: I Expect You To

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**Class attendance:** A substantial part of my notes are provided during class and therefore, regular attendance is strongly encouraged.

**Questions during class:** If you would like quick clarification during a lecture, I encourage students to raise their hand and I will invite you to ask the question. However, if you think the question will take a longer to answer, you can come see me at the end of lecture or make an appointment with me via email to meet at a later time in my office.

**Policy regarding late assignments:** Students will not be permitted to write make-up tests or hand in assignments late, except for documented medical or compassionate reasons. Please make yourself familiar with the class schedule well in advance of mid-term tests and the final exam.

**Academic integrity:** Students should acquaint themselves with the University's policy on plagiarism, cheating, and examination impersonation (see University of Manitoba General Calendar).

## Students Accessibility Services (SAS)

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If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

*Student Accessibility Services* <http://umanitoba.ca/student/saa/accessibility/>

520 University Centre

204 474 7423

[Student\\_accessibility@umanitoba.ca](mailto:Student_accessibility@umanitoba.ca)

## **Expectations: You Can Expect Me To**

**Course notes:** Lecture handouts will be provided digitally to the student. Please note that a considerable amount of material beyond the course notes will be provided during the lecture. All material to appear in both the mid-term and final test will be provided during the lecture and/or in the course notes.

**Evaluative feedback:** Test 1 marks will be provided before the voluntary withdrawal deadline date, November 19.

**Humour:** I will attempt it sporadically.

## **Class Schedule**

This schedule is subject to change at the discretion of Dr. Mundy and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the – [ROASS](#)- Procedure.

Date	Class Content	Required Readings or any Pre-class Preparation	Evaluation
Sept. 11- Oct. 16	<p><b><i>Introduction and fundamental aspects - Chapters 1 &amp; 2</i></b></p> <ul style="list-style-type: none"> <li>• History of biological oceanography</li> <li>• The abiotic environment</li> </ul> <p><b><i>Phytoplankton - Chapter 3</i></b></p> <ul style="list-style-type: none"> <li>• Phytoplankton primer</li> <li>• Phytoplankton ecology</li> </ul> <p><b><i>Zooplankton - Chapter 4</i></b></p> <ul style="list-style-type: none"> <li>• Zooplankton primer</li> </ul>		
Oct. 9	Topic abstract and prospective reference list for Research Paper		Worth 5% of final mark
Oct. 16	Abstract marked		
Oct. 18	Mid-term test		Test will consist of true/false, short answer, and essay style questions – Worth 20% of final mark
Oct. 23- Dec. 4	<p><b><i>Zooplankton - Chapter 4 – cont'd</i></b></p> <ul style="list-style-type: none"> <li>• Zooplankton primer</li> <li>• Zooplankton ecology</li> </ul>		

	<p><b><i>Energy Flow and Mineral Cycling (Pelagic) - Chapter 5</i></b></p> <ul style="list-style-type: none"> <li>• Foodwebs</li> <li>• The microbial loop</li> <li>• Estimating secondary production</li> <li>• Mineral cycling</li> </ul> <p><b><i>Biogeography (Pelagic)</i></b></p> <ul style="list-style-type: none"> <li>• Biogeography</li> <li>• Biomes and provinces</li> </ul> <p><b><i>Biological Oceanography and Climate Change - handout</i></b></p>	<p><i>Handout will be supplied</i></p> <p><i>Handout will be supplied</i></p>	
Oct. 25	Mid-term test marked		
Nov. 6 and 8	Assignment: Create a demonstration that teaches a concept of Biological Oceanography		Worth 20% of final mark
Nov. 12-16	Remembrance Day and Fall Break		No Classes
Nov. 19	Last date for Voluntary Withdrawal from in Fall Term courses		
Dec. 4	Research Paper due		Worth 30% of final mark
Dec. 6	Final test (cumulative)		Test will consist of true/false, short answer, and essay style questions – Worth 20% of final mark

## Course Evaluation Methods

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A variety of methods to give all types of learners an opportunity to excel will be used in this course. The tests will consist of true/false, short answer and essay style questions; the Assignment presentation will be used to build upon the student's presentations skills; and the Research Paper will help develop critical thinking and writing skills.

Due Date:	Assessment Tool	Value of Final Grade
N/A	Class Participation	5%
Tues., Oct. 9	Topic Abstract and prospective reference list due	5%
Thur., Oct. 18	Mid-term test	20%
Tues., Nov. 6 Thur. Nov. 8	Assignment: Create a demonstration that teaches a concept of Biological Oceanography	20%
Tues., Dec. 4	Research Paper due	30%
Thur., Dec. 6	Final test	20%

## Grading

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Letter Grade	Percentage out of 100	Final Grade Point
A+	90-100	4.5
A	80-89	4.0
B+	75-79	3.5
B	70-74	3.0
C+	65-69	2.5
C	60-64	2.0
D	50-59	1.0
F	Less than 50	0

## Referencing Style

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Assignments should use a single reference style throughout corresponding to the format used in one of the following journals: Limnology and Oceanography, Polar Biology, Marine Ecology Progress Series, or Deep Sea Research.

## Assignment Descriptions

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**TITLE**-Assignment: Create a demonstration that teaches a concept of Biological Oceanography

**GOAL**-This assignment will help build presentation skills

**PROCEDURE**-Documents of numerous elementary through high school level hands-on demonstrations on Marine Biology and Oceanography will be provided to the student. The student is to pick one of the demonstrations and adapt it to explain a concept of Biological



Oceanography taught in class. An example presentation will be given by Dr. Mundy at the start of the term.

**EVALUATION CRITERIA-** The demonstration will be marked according to student's understanding (50%), presentation quality (20%), and creativity (30%).

**TITLE-**Research Paper

**GOAL-**This assignment will help build critical thinking and writing skills

**PROCEDURE-**The Research Paper will consist of two different submissions: 1) Abstract and Reference List and 2) Research Paper. The Research Paper is to focus on the influence of climate change on an aspect of biological oceanography covered in class. Dr. Mundy will assist in guiding the student to choose a topic for the paper and will use the Abstract and Reference List submission to provide feedback for the student at an early stage in the development of his/her Research Paper. The two different submissions will consist of the following:

1) Abstract and Reference List

- Tentative title – should explain the topic in a concise statement
- Abstract – 4-5 sentences outlining the topic. The final statement should be a thesis statement, which clearly and concisely state's the goal of the Research Paper in a single sentence
- Reference List – provide a list of 10 potential references that you will likely use in your research paper (Use a single journal reference style throughout (L&O, Polar Biology, MEPS, or Deep-Sea Research) and only cite journal articles and published books)

2) Research Paper

- 10 pages, double spaced, 12 pt TNR Font
- **Abstract** – Summary of 150-250 words
- **Introduction** – Describe the importance (motherhood) of your topic, provide a short background to set the stage for your paper, then conclude with thesis or objectives of your paper
- **Body** – Summarize what is known and provide a critical review and analysis of your topic (i.e., What isn't known? Should additional questions be asked? How do you think the science can be moved forward?); Do not be afraid to include figures!!
- **Conclusion** – This is not an abstract, conclude on what you discuss in the paper and particularly, relate back to your original thesis of the paper
- **References** – Use a single journal reference style throughout (L&O, Polar Biology, MEPS, or Deep-Sea Research) and only cite journal articles and published books

**SUBMISSION GUIDELINES** – Submissions should be made as word documents via email.

**EVALUATION CRITERIA** – Each submission will be marked on the following:

1) Abstract and Reference List

- The title and abstract will be marked on length (20%), information provided (30%), sentence structure (10%) and creativity (30%). The Reference List will be marked on correct format (5%) and appropriateness of citation (5%).

2) Research Paper

- The Research Paper will be marked according to length (10%) abstract (20%), introduction (20%), Body organization and content (30%), conclusion (20%) and References (10%)