

COMMUNICATING SCIENCE

Biology 5010-FA Graduate Seminar

COURSE OUTLINE FALL 2023

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Lectures, Class discussions and Research seminars: Fridays 2:30 pm – 5:30 pm
Locations: ATAC 2021; Orillia OA 1025

Course Objectives – *What will you learn?*

During this course you will ...

- develop skills to present scientific information in different formats addressing varied audiences.
- apply information from lectures and recommended textbooks to organize your thoughts and ideas for effective written and oral communications.
- become comfortable in discussing issues relating to different areas of biological sciences.
- learn how to evaluate the presentation of a piece of scientific work critically and fairly.
- appreciate the breadth and depth of fields in biology by approaching all sessions with an analytical mindset and asking questions on issues you find interesting.
- improve and expand your critical understanding of major concepts in the biological sciences.

By the end of this course, you will be comfortable in ...

- organizing your thoughts to structure your thesis and research publications, asking the relevant scientific question(s), developing the necessary research protocols, record, analyze and interpret data to arrive at meaningful conclusions.
- attending scientific presentations, seminars, asking questions, participating in discussions, and exchanging scientific ideas.
- giving your own oral presentations.
- evaluating scientific papers and reports.

Course Structure – *How will you learn?*

Introductory lectures

At the beginning of the semester there will be 2-3 introductory lectures by the instructor emphasizing i) the need for scientific communication, ii) scientific methods, iii) the general structure and content organization of a thesis, research proposal preparation and oral presentation of thesis proposal.

Biology retreat

Each year in the fall the new graduate students along with previous years graduate students and selected upper-level undergraduate students organize a full-day retreat at Kingfisher field center consisting of brief introduction followed by nature walks, short field trips in the nearby forests and lakes. This provides an opportunity to meet the fellow students and faculty and discuss science in a relaxed and informal setting. After the Saturday evening dinner, we hold a “Round Table” discussion of each new graduate student’s research topic to provide an informal discussion and opportunity offer and receive feedback from faculty and peers. Students are asked to present verbally 1) their research topic, 2) academic rationale for this research, and 3) the types of data they might collect to answer the question(s) they set forth. The idea of this exercise is to encourage students to begin to think about related concepts and set the stage for their thesis proposal presentations later in the semester.

Attendance and participation

Class time will provide students with the opportunity to discuss major themes in the Biological Sciences. Participation is the lifeblood of this course and students are expected to contribute positively. Please come to class prepared to discuss the week’s assigned readings or contribute to the discussion of a seminar presentation.

Oral presentation

Each student will give one oral presentation for 15 minutes followed by 5 minutes of question and answer. For most students, this will be a practice of their thesis proposal presentation as required for the MSc program in Biology. If you have already presented a thesis proposal, the presentation should cover a summary of your research progress. Please sign up in advance for these presentations.

Summary of a speaker presentations and critique: Students are required to familiarize themselves with the subject matter of upcoming seminar presentations (often from the presenters’ own synopses) before class. Time permitting, following the seminar, the guest speaker will meet separately with the BIOL-5010 class for 15-30 minutes to further discuss questions and other items brought forward by the students. Because of COVID-19 restrictions this year’s research seminars will be delivered online. After each seminar presentation there will be opportunity to ask questions. A two-page 1.5-line spaced summary of the presentation and discussion needs to be submitted for evaluation following four presentations; the first two seminars are compulsory, then submit one in the student’s own field of research and one outside their field of research. **Note that participation at every seminar is mandatory

Abstract writing and presentation exercise

Students are required to write an abstract from a journal paper/manuscript and present the work in a brief 5minute power-point presentation to the class. The abstract and presentation will be marked.

Reflection

At the end of the semester, you will submit a 1.5 to 2 pages descriptive account reflecting on your course experience. The evaluation of this submission will be based on your ability to identify relevant issues, in-depth reasoning (giving specific examples) and suggestions for improvements.

You should work towards this paper throughout the semester. Keeping a small notebook to chronicle your thoughts might be helpful. Consider the following questions:

- What have you learned so far?
- What did you like and why?
- What did you not like and why?
- Has the course achieved the objectives stated? Why or why not?
- What areas would need more attention? Why and how?
- Are you satisfied with your own contributions to the course? Why or why not?
- What are your plans for improvement?
- How did your course experience change throughout the two semesters?

Written Submissions

All written work is due within one week (7 days) of being assigned and will be returned, graded with comments, one week following. Late submissions will not be accepted. Please remember this a graduate level course and an emphasis on critical thinking, formulated into coherent, well-structured, publication caliber writing is required. Furthermore, spelling, and grammatical structure appropriate to graduate level performance is expected and will be duly evaluated on all written work. You are strongly encouraged to seek out one or more proofreaders to review all written work prior to submission.

Class Policies

Attendance:

Class attendance will be determined through submission of your assignments. If you cannot complete an assignment by the stated deadline, please contact us before that deadline to arrange an alternate time. I am willing to be a little flexible (within reason) but only for a good reason (such as illness, having to travel for work). Chronic lateness without prior approval will lead to reduction in your grades (10% per day late). It is important that you keep up with your weekly work! This is NOT a self-paced course.

Academic Honesty:

Each student is expected to do all their own work. I expect you to turn in your own work as the product. For some assignments I will be using the Safe Assignment tool in

Blackboard to check for plagiarism. For quizzes and midterm and final exams, we expect you to do all your own work. Academic dishonesty, in any form, will result in an “F” in the course.

Prescribed textbook

Margaret Northey and Patrick von Aderkas (2019). *Making Sense: A student’s Guide to Research and Scientific Writing* (6th edition). Oxford University Press. Don Mills, Ontario, Canada. Purchase through LU bookstore or your own. A cheaper e-version of this book is also available through LU bookstore.

Other recommended textbooks

Barbara Gastel and Robert A. Day. 2016. *How to Write and Publish a Scientific Paper* and. 8th ed. Academic Press, an imprint of Elsevier Science, San Diego, Ca. Available in the bookstore. Also available as E-book on-line.

John M. Swales and Christine Feak 2012. *Academic Writing for Graduate Students*, 3rd Edition: Essential Tasks and Skills.

R (Chandra) Chandrasekhar. 2008. *How to Write a thesis: Working Guide*. Centre for Intelligent Information Processing Systems (CIIPS) School of Electrical, Electronic and Computer Engineering. University of Western Australia, Crawley, WA
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Briscoe, M.H. 1996. *Preparing scientific illustrations: a guide to better posters, presentations, and publications*. Springer, New York, NY. Call-#: Q 222 B75 1996

Scientific style and format: the CBE manual for authors, editors, and publishers. Cambridge University Press, New York. 1994. Call-#: Z 250.6 B5C8 1994 (Paterson Reference, Main Floor, non-circ.)

Additional Readings

“How to Be a Good Graduate Student” by Marie des Jardins. 1994. Available on the WWW at: <http://www.cs.indiana.edu/how.2b/how.2b.html>

Thesis Writing in the Sciences, University of Florida

More suggested readings and assigned readings will be distributed throughout the course.
Fall 2022 Schedule

September 8. Introductory lecture

At the introductory lecture aims and objectives of the course will be discussed including the need and modes of scientific communication, course structure, expectations, and evaluation criteria. Thesis proposal presentations will be on Nov. 18, 25. Helpful literature regarding effective abstract writing will be discussed. You are asked to review

the material in the textbook prior to the class. There will be a TA training session at CB 3013 by Biology technicians after this short (one-hour) introductory class.

September 15, Lecture 2: Essentials for oral and written scientific communications, and thesis research process.

September 22, Lecture 3: First there will be a short lecture on how to listen, take notes and ask questions in a research seminar and prepare a written critique of the seminar. Next, I shall discuss how to write (what to include/expect in) an Abstract of a journal article. Finally, I shall discuss what involves in thesis research, writing thesis and preparing and submitting manuscript to a peer-reviewed journal, communicating with journal editor and handling of reviewer comments. Finally, we shall have a discussion on Research Seminars.

September 29, Abstract presentation: Students will present abstracts prepared as per discussion in the previous class (September 23). The presentations will be in PowerPoint form (6-8 slides) and be no longer than 5 minutes. Emphasis here is on summarization and iteration of the research question(s) highlighting the main results and their significance in the research paper examined.

October 6. Research Seminar- 1

Speaker: Dr. Carissa Brown, Department of Geography, Memorial University of Newfoundland, ST. John's, NF

Title: Fires, feasts, and frosts: constraints on plant species' range expansion under ongoing climate change

Host: Dr. Azim Mallik

October 13 No seminar (Midterm break, Thanksgiving weekend)

Oct 20, Research Seminar- 2

Speaker: Yang Xu, Department of Molecular and Cellular Biology, University of Guelph

Title: Plant and microalgal lipids: Biochemistry and Biotechnology

Host: Wensheng Qin

October 27, Research Seminar- 3

Speaker: Dr. Diane Srivastava, Biodiversity Centre, UBC, Vancouver

Title: Climate change and the reshaping and rewiring of food webs

Host: Dr. Doug Morris

November 3, Research Seminar- 4

Speaker: Dr. Laura Hug, Canada Research Chair, University of Waterloo.

His title: Life in black goo: multi-omics of biofouling at municipal landfills

Host: Dr. Wensheng Qin

November 10, Research Seminar- 5

Speaker: Dr. Heather Khrouba, Department of Biology, University of Ottawa.
Title: Climate change and the timing of species interactions
Host: Dr. Adam Algar

November 17, Thesis proposal practice presentations

As part of the fulfillment of the requirements of the M.Sc. Biology program at Lakehead University, each student is required to present, publicly, a thesis proposal wherein the student describes their research plan and demonstrates *why* their research is novel and worthwhile. While the thesis proposal does account for a large part of a student's final grade, it represents, more importantly, an opportunity to receive valuable feedbacks on the research topic in question. *Dates for thesis proposal presentation for individual students will be chosen on the first day of class.*

November 17, Thesis proposal practice presentations

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November 24, Thesis proposal practice presentations

Marks Breakdown

Abstract Writing Exercise	10
Abstract Presentation	10
Journal Paper critique	10
Seminar Critiques (3 x 10)	30
Thesis Proposal Practice Presentation	20
Reflections	10
Attendance & participating in discussion (5+5)	<u>10</u>
Total	100

Abstract Presentation: Student Number: _____

Students will prepare a brief (3-5 minute) PowerPoint presentation wherein they shall discuss the abstract they have written. The presentation should NOT be a reading of the written abstract. Rather, it should highlight elements you, the author, deem necessary for a thorough understanding of the research paper you've examined. The intent here is to familiarize students with presenting before an audience of peers.

While flexibility does exist in this exercise, there are certain "essentials" which must be present: (a) coverage of the key concepts/themes/etc., (b) a logical, clear, and concise presentation of the material, and (c) evidence of appropriate preparation. Feel free to contact your teaching assistant for comments or suggestions on your abstract prior to preparing your presentation. Good Luck!

Criteria	Max Mark	Given Mark	Justification (details on reverse)
Coverage of key concepts/themes/ideas/etc.	3		
Logic structure and thoughtful slide design	3		
Voice projection, overall practice	2		
Ability to answer questions	2		
Total	10		

Marking Scheme for paper Critique

Student Number: _____

Criteria	Max. Mark	Mark Given	Justification (details on reverse)
Identify the central question(s), or issue(s), hypothesis,	1		
Discuss the approach taken to test the hypothesis or address the question/issue.	2		
How well the data were presentation? - Tables - Figures - Clarity of written text	2		
How well did the evidence (data, logic) support the hypothesis, question, or issue? (i.e., are there elements that you feel were missing/ignored?)	2		
How well the results were discussed (supporting and not supporting the data) considering literature?	2		
What was/were the main conclusion(s)? What appears to be the next step, topic of inquiry?	1		

Marking Scheme for Seminar Speaker Critiques

Student Number: _____

Criteria	Max. Mark	Mark Given	Justification (details on reverse)
Identify the presentation's hypothesis, central question(s), or issue(s)	2		
Discuss the approach taken to test the hypothesis or address the question/issue.	2		
How well did the evidence (data or logic) support the hypothesis, question, or issue? (i.e., are there elements that you feel were missing/ignored/etc.?)	2		
How was the presentation's delivery? For example: - Visuals, use of technology - Rapport with the audience - Balance of breadth and depth - Audience-appropriate level of detail - Overall impression	2		
How did the speaker handle questions?	1		
What did you learn? What was surprising to you about this presentation? What appears to be the next stage/step, topic of inquiry for this speaker? What would you like to see this researcher do next?	1		

Thesis Proposal Practice Presentation Marking Scheme

Student Number: _____

Criteria	Max. Mark	Given Mark	Justification (details on reverse)
Clarity of the context, research question(s), hypotheses	5		
Appropriate depth of research	5		
Organization of the material, logical use of legible visual aids/illustrations	4		
Style of delivery, enthusiasm	3		
Ability to generate interest.	1		
Answering questions	2		
Total	20		

Marking Scheme for Reflections

Student Number: _____

<p>BIOL 5010 benefits greatly from the input of students. This final exercise is an opportunity for you to provide feedback, which will ultimately be used in the design of next year's class. Here, more than anywhere else, there exists room for you to be creative. Keep in mind though, that it is important to provide <i>specific examples</i> to support your position. <i>Many Thanks!</i></p>			
Criteria	Max Mark	Given Mark	Justification (details on reverse)
<p>Discuss some of the skills you've acquired/improved upon in the class.</p> <p>Are you satisfied with your contributions to the class?</p>	2		
<p>What worked well in the class?</p> <p>What would you have done differently and why?</p>	1		
<p>What would you have added to the class to improve it?</p>	0.5		
<p>Use of appropriate, detailed examples (from the class) to justify your position re: the above</p>	0.5		
<p>Spelling, grammar, formatting, etc.</p>	1		
Total	5		

Mark allocation rubric

Level 4 (90- 100%, outstanding) expectation:

Organization/Structure – Considerable evidence of original thinking; outstanding grasp of subject matter, evidence of extensive knowledge base and outstanding capacity to synthesize. Information is very well-organized with well-constructed paragraphs. Paragraphs contain appropriate introductions, and/or transition neatly from one another. Document presents logical flow of information.

Information/Detail – Writing/presentation contains appropriate level of detail for the general audience. Detail level is such that pertinent aspects are included, and less relevant components are excluded or glossed over, to preserve timing/word-count. Novel concepts are introduced at an appropriate knowledge depth.

Presentation skills/Slides – Presentation speed is easy to follow. Presenter can make eye contact with the audience and appears to be engaging. Presentation is of appropriate length. Slides contain only pertinent details and are succinctly worded. Visuals are present and are easy to follow.

Level 3 (80-90%, very good) expectation:

Organization/Structure – Evidence of grasp of subject matter, evidence of critical thinking and understanding of relevant issues; evidence of familiarity with the literature. Information is organized with well-constructed paragraphs. Paragraphs contain appropriate introductions, and/or transition neatly from one another. Document presents logical flow of information.

Information/Detail – Writing/presentation usually contains appropriate level of detail for the general audience. Detail level is such that pertinent aspects are present. Novel concepts are introduced at a knowledge depth appropriate for most audiences.

Presentation skills/Slides – Presentation speed is easy for most of the audience to follow. Presenter can make some eye contact with the audience. Presentation is of appropriate length. Slides contain only pertinent details and contain appropriate word count. Visuals are present.

Level 2 (70-80%, good) expectation:

Organization/Structure – Evidence of good understanding of the subject matter, ability to articulate ideas and concepts clearly. Information is relatively organized. Paragraphs may or may not contain introductions, and usually transition well from one another. Document mostly presents logical flow of information.

Information/Detail – Writing/presentation usually contains appropriate level of detail for the general audience. Sufficient detail is included such that most of the pertinent aspects are present. Novel concepts are introduced at a knowledge depth appropriate for most audiences.

Presentation skills/Slides – Presentation speed may be too fast or too slow. Presenter can make some eye contact with the audience but may also be reading off the slides at times. Presentation is slightly long or short. Slides contain pertinent details but are somewhat wordy. Visuals are limited.

Level 1 (50-70% marginal, in graduate course 70% is a passing mark) expectation:
Organization/Structure – Evidence of minimally acceptable understanding of the subject matter. Information is disorganized. Paragraphs do not transition well from one another.
Information/Detail – Writing/presentation usually contains a level of detail that is overtly simplified, or too complicated for a general audience, though crucial points are included.
Presentation skills/Slides – Presentation speed is too fast or too slow, and presenter is usually reading off the slides. Presenter is unable to engage the audience. Presentation is overtly long or short. Slides are excessively wordy.

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Academic Honesty:

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