

Course Information and Syllabus

Instructor: Dr. Jon Scales
12:00-12:50 M BO 209
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Office: PH109
Office Hrs: M-R 9-11 or
by Appointment

Prerequisites: Senior Biology Major graduating Spring 2024 – Fall 2024

Text: *Writing Papers in the Biological Sciences*, Victoria E. McMillan, 3rd ed. 2001. ISBN 0-312-25857-7. *Reading Primary Literature: A Practical Guide to Evaluating Research Articles in Biology*, Christopher M. Gillen, 2007. ISBN 0-8053-4599-X.

Philosophy:

Senior Seminar in Biology is a capstone course. The purposes of a capstone course are to measure overall competencies in Biology knowledge and scientific skills. These measures will occur as follows:

1. Provides a venue for students to demonstrate oral communication skills by preparing and presenting a seminar presentation as would be expected at professional meetings and conventions. Seminar should help the student prepare to communicate with an audience of peers both formally and informally.
2. Provide a forum for students to demonstrate their ability to discuss and evaluate peer-reviewed research publications on a current topic.
3. Examine basic concepts and current topics in biology.
4. Assess competency of biology graduating seniors in the use of microscopes.
5. Assess ability of biology graduating seniors to generate, understand, and correctly interpret data presented in tabular and graphical formats.
6. Assess ability of biology graduating seniors to critically and effectively read and evaluate professional literature.
7. Assess proficiency in biology via the comprehensive Major Field Test in Biology.

Students enrolled in seminar are expected to:

1. Prepare a written evaluation of a peer-reviewed, primary research article.
2. Give a 15 minute presentation based on a peer-reviewed, primary research article.
3. Peer-evaluate presentations.
4. Demonstrate competency in microscope use
5. Demonstrate ability to interpret data presented in tabular and graphical formats
6. Demonstrate mastery of biological concepts and facts

Course Instructions*Proficiency Exams*

One exam will evaluate your ability to generate, understand, and correctly interpret data that are presented in tabular and graphical formats. A second exam will evaluate your competency in the use and care of microscopes. Review materials for these exams are provided on D2L.

On Saturday morning **February 24th 9:00 -12:00**, each student will take the comprehensive Major Field Test (MFT) in Biology. This separate date/time is necessary due to the 2 hour time requirement of this standardized exam. **YOUR ATTENDANCE ON THIS DATE TO TAKE THE EXAM IS MANDATORY!** Your **performance** on the MFT exam comprises 10% of your course grade. Your total test score from the Major Field Test will range from 120-200. For this purpose your MFT grade will be normalized to a 180 point scale. Take pride in yourself and take your performance on the MFT seriously! Prepare for it by reviewing all areas of biology and do your best on it.

Literature Evaluation

Choose a peer-reviewed **primary** research article published within the last FIVE years (2018-2023) involving basic research in any area of biology (e.g. **cell biology, developmental biology, ecology, evolutionary biology, genetics, immunology, microbiology, molecular biology, physiology**). **You must choose articles from this set of journal sources.**

Cell journals: www.cell.com (select from biology journals in the dropdown 'Journals' tab excluding any "Trends in ___" journals which only publish review articles.)

The Company of Biologists journals: www.journals.biologists.com/journals (select from Development, J. Cell Sci, J Exp Biol, Biol Open)

Developmental Biology: www.sciencedirect.com/journal/developmental-biology/issues (select from issues between 2018-2022 which are free online)

Journal of Ecology: www.besjournals.onlinelibrary.wiley.com/journal/13652745 (browse issues, many current articles are open access, as well as those between 2018-2023.)

Evolution: www.academic.oup.com/evolut/issue (select from issues between 2018-2023, as well as some more current articles).

Journal of Plant Physiology (www.sciencedirect.com/journal/journal-of-plant-physiology) (select from issues between 2018-2023 which are free online)

Your chosen article must be submitted and **approved** by the instructor for use in your presentation a minimum of **three (3) weeks before** your presentation is scheduled. Late approval submissions will result in point loss. Submit an article for approval by **attaching it to an email as a .pdf. DO NOT SEND A LINK to an article** (again you'll lose points). **You will upload your article and all supplementary materials as .pdf files to the D2L dropbox after approval of your paper.** Once your paper is approved, you will generate an appropriate title for your seminar presentation and prepare flyers to announce your presentation to be posted in designated locations of Bolin Science Hall. Flyers **MUST also be approved by the instructor a minimum of 2 weeks before your presentation. After the flyer is approved, upload it to D2L as well. Your presentation title should not be exactly the same as the article title used for your presentation.** The flyer must have the full article citation on it somewhere in addition to your name, presentation date, time & location. Do not make your flyer with a mostly dark colored background. They look good on a computer screen, but are not good to print.

You are required to complete a written exercise to assess your ability to critically and effectively read and evaluate professional literature (see separate handout concerning the exercise). This exercise will be completed and turned in to your instructor **ONE WEEK BEFORE** your presentation.

Your instructor will make copies of the journal article for everyone in seminar and give them to you for distribution to the class **ONE WEEK BEFORE** your presentation day. Each student must **read the presenter's article prior to the presentation and come to the presentation prepared with two questions** about the paper or topic in general. Type up and print out your questions which will be turned in at the presentation. There is only 5 min allotted for questions at the end of each presentation, but, time permitting, your prewritten questions or others may be asked to the presenter during the Q & A period.

Presentation

Give a **15 minute** presentation on the article and topic it concerns using **Powerpoint** format. Points on the presentation are lost if it is less than 14 minutes or over 16 minutes in length. The presentation should address the following lettered items (Some possible questions to consider are also listed below each):

- A. Background on the topic of the research article
 1. What is the significance of the research topic in the overall scheme of biology?
 2. Any prior or related work reported on the topic?

- B. Hypothesis/Problem/Question addressed in the research article
 - 1. Why was the research performed?
 - 2. What was trying to be answered?
- C. Methods and Procedures used
 - 1. How was the research carried out and conducted?
- D. Results
 - 1. Was the hypothesis/problem studied and answered?
 - 2. Were there any unexpected results/problems?
- E. Conclusions
 - 1. Were appropriate conclusions drawn?
- F. Critique of the work
 - 1. Were methods appropriate for the study?
 - 2. Was interpretation of any of the data incorrect?
 - 3. Is there anything you suggest have been done differently?
 - 4. What other work would you suggest be done?

After completing your presentation, you will be expected to answer questions concerning your topic from those in attendance. Generally, 5 minutes will be allotted for questions. Each presenter will have a maximum allotted time of 20 minutes.

Your presentation will be one that YOU have prepared specifically for this class and cannot be one that was used in any of your previous classes. Be forewarned, if it is determined that you have recycled a presentation; an “F” will be assigned as your grade for the course. Students should refer to the current MSU Handbook and Activities Calendar for university policy on academic dishonesty, student rights and activities.

Your presentation must be given on your date. Our schedule is very much locked in without any wiggle room for illness, bad weather, cousin’s weddings, etc... Get it done and get it over with.

Evaluation

Each student will evaluate all of their classmates’ presentations. Therefore, **attendance at ALL seminar presentations is MANDATORY. A minimum of 10 points will be deducted from your presentation grade for any day missed. A minimum of 5 points will be deducted for being late to a presentation.** We only meet one day a week for an hour, so I expect all of you to always be here for class. See the MSU Handbook for information on class attendance policy.

Each student is required to read the papers presented by each of their peers. To that end, each student will turn in a set of TWO, non-trivial, questions at the beginning of the presentation for each of the papers presented by their peers. These questions will contribute 10pts toward the peer evaluation grade category.

Student presentations were scheduled using the Wheel of Names web app (www.wheelofnames.com). The order of presentations is given in the schedule below and will be available on D2L. **DON’T PROCRASTINATE!!** Start working on your presentations immediately in case any problems arise with getting your presentation together. From the journal sources above, you should be able to find a suitable primary research article. However, **DO NOT PROCRASTINATE** in looking for one. You should use google scholar rather than a plain google search when searching for articles on a subject of interest. You may also simply peruse the issues of one or more of these journals and identify a paper that is interesting enough to you to make a presentation on.

When you have your Powerpoint presentation completed, always make sure that you have given it a “trial run” with the computer/projector set-up in our classroom where you will be giving your actual presentation. **You must bring your presentation on a USB drive for use on the classroom computer. DO NOT RELY ON CLOUD/EMAIL/INTERNET ACCESS for your presentation.** You should **practice the delivery** of your presentation many times to ensure that you have it “fine-tuned” for the time you present it to the class. **You must upload your final presentation file to D2L presentations folder on or before the day of your presentation.**

Course Grading:*Presentations:*

Oral presentation	150 points	
Peer evaluations & questions	30 points	
Flyer production & posting	<u>20 points</u>	
	200 points	
Oral presentation (including attendance)		60%
Microscope proficiency exam		10%
Graphs/Tables proficiency exam		10%
Written exercise on reading & evaluating literature		10%
<u>Major Field Test in Biology</u>		<u>10%</u>

PHONES & OTHER ELECTRONIC DEVICES MUST BE OFF AND PUT AWAY IN THE CLASSROOM

Schedule

Week	Date	Activity
2	1/22	Intro, Literature Search, Lit Eval,
3	1/29	Peer Eval, Table & Graph Overview, MFAT Overview
4	2/5	Scope Practice,
5	2/12	Microscope Proficiency Exam
6	2/19	Table & Graph Proficiency Exam
6	2/24	Major Field Exam SATURDAY 9-12
7	2/26	Sydney & Zachary
8	3/4	Olivia & Elizabeth
	3/11	Spring Break
9	3/18	Stephanie & Callie
10	3/25	Esmeralda & Luis
11	4/1	Chloe & Isaiah
12	4/8	Eclipse Day
13	4/15	Cecilia & Andrew
14	4/22	Crae & Kaitlyn
15	4/29	Exit Survey, Course Eval, MFAT results
		Finals Week (if incimate weather day occurs)