

BSC4936: Critical Analysis of Biological Research Spring 2020

I. General Course Information

Instructors

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Office hours: Virtual office hours via Zoom on canvas. Email, phone, or visits in our physical office can be arranged, please email your assigned TA or Dr. Mutahi as needed to schedule.

Description

Critical analysis of current life sciences research through online discussions of peer reviewed scientific publications. Through a Virtual Exchange interaction, students interact online with global expert guests through lectures and Question & Answer sessions to enhance global citizenship skills. Students complete the Biology Major Field Test (MFT).

Website

Access this course website through UF e-Learning Services (<https://lss.at.ufl.edu/>). Log in using your Gatorlink username and password. The software used to host the website is “Canvas”.

Required Materials

1. Reliable internet access that will allow completion and submission of assignments on time.
2. Microsoft Office or equivalent (written assignments must be submitted in Word format).
3. Microphone & camera for recording presentations or attending office hours via zoom/skype.

Course Format

This course contains 8 distinct modules (see “Module Descriptions” below). Each module will require students to participate in a combination of activities, including:

1. Reading a peer-reviewed scientific article (or watching a seminar video)
2. Participating in group discussions (approximately 6 - 10 people)
3. Writing a summary of a scientific article
4. Writing a peer review of another student’s article summary
5. Taking brief online quizzes
6. Participating in a Virtual Exchange interaction with global expert guest lectures with a Question & Answer time via zoom to enhance your global citizenship skills.
7. Submitting a virtual PowerPoint presentation
8. Participating in an online role-playing exercise
9. Completing the Biology Major Field Test MFT

These activities are described in more detail in Section III (Assignment Guidelines) below. **Be aware that there are many deadlines in this course, and students should mark each of them in their calendars to stay on track. Each deadline is documented in the “Module Descriptions” section of this syllabus below.**

II. Module Descriptions and Dates

(All assignments are due by 11:59pm on their due date)

Module 1: Introduction (40 pts)

Read syllabus, begin discussion and start on Icebreaker activity

- Ice-breaker discussion (Opens Jan 6- Closes Jan 15)
- Discussion of the syllabus (Opens Jan 6 - Closes Jan 15)
- Take a quiz on the syllabus (Due Jan 16)
- Take a pre-quiz on ethics in research (Due Jan 16)

Module 2: Discuss and Summarize a Research Paper (20 pts)

Starting with Module 2, students will be assigned discussion groups of six to ten. Note that all assignments other than discussions should be completed (and will be graded) individually. In Modules 3 and 4, each student will be assigned an individual peer review to complete. Group membership will be visible in the "People" section of the course's canvas page at the beginning of this module.

- Discuss a research article (Opens Jan 17 - Closes Jan 23)
Article: Machine learning of neural representations of suicide and emotion concepts identifies Suicidal youth. Nature Human Behavior | VOL 1 | DEC 2017 911–924

- Submit a summary of the article (Due Jan 24)

Module 3: Discuss and Summarize a Research Paper, Review a Peer's Summary (25 pts)

- Discuss a research article (Opens Jan 25 - Closes Feb 1st)

Article: Caffeinated forage tricks honeybees into increasing foraging and recruitment behaviors. 2015. Current Biology 25: 1-4.

- Submit a summary of the article (Due Feb 4)
- Submit a peer review of another summary (Due Feb 7)

Module 4: Discuss and Summarize a Research Paper, Review a Peer's Summary (30 pts)

- Discuss a research article (Opens Feb 8 - Closes Feb 13)

Article: Protecting ourselves from food: spices and morning sickness may shield us from toxins and microorganisms in the diet. 2001. American Scientist 89: 142-151.

- Submit a summary of the article (Due Feb 15)
- Submit a peer review of another summary (Due Feb 19)
- Submit the date and time of your MFT (Due Feb 19)

Module 5: Discuss and Take a quiz on a seminar (20 pts)

Seminar: Exploring the crossroads of attention and memory in the aging brain: Views from the inside

- Discuss the assigned seminar (Opens Feb 20 - Closes Feb 25)
- Take a quiz on the seminar (Due Feb 26)

Module 6: Participate in an Online Role-Play and Discuss Ethics in Research (30 pts)

The lab: avoiding research misconduct. 2011. USHHS, ORI.

- Discuss ethics in research (Opens Feb 27- Closes Mar 12)
- Take a quiz on ethics in research (Due Mar 13)

***** February 29 - March 7: Spring Break*****

Module 7: Discuss Published Paper, Virtual Guest Lecture with O&A and Present a PowerPoint with Audio (20 pts)

- Discuss a research article (Opens Mar 14 – Mar 19)
Article: Global and regional health effects of future food production under climate change: a modelling study
- Attend Virtual Guest Lecture via Zoom (Opens Mar 19– Apr 3rd)
- Submit a virtual PowerPoint presentation (Due Apr 3rd)

Module 8: Take a the Biology Major Field Test (30 pts): Feb 17th and April 22nd

The MFT is a 2-hour test given primarily online, although a written test is available. The University of Florida uses the results to assess student learning outcomes. If you score well, your score should be included on your CV or resume to indicate how you compare to other applicants (for jobs, graduate school, etc.) who have the same degree as you. It is in your best interest to try to do well on this exam.

Scheduling occurs on or before Feb 17th. You will receive an email from the testing agency with instructions on how to register to take the test. The test may be taken between Feb 17th and April 22nd. Students must submit the time and date of their exam on Canvas during Module 4 (Due Feb 19th).

Please do not miss your scheduled test time. Your course fee pays for only one scheduled time, if you miss the scheduled time the university will be charged and you will forfeit the fees that were paid for that appointment. To reschedule a missed appointment, you will need to make arrangements with the proctoring agency.

A suggested study schedule for topics is provided below. The following link contains more information about the exam and a set of sample questions:

<https://www.ets.org/mft/about/content/biology>.

Suggested Review Schedule for Preparation to take the Biology MFT		
Week	Biology MFT Topics*	Estimated % of Questions on Test
1	Biochemistry & Cell Energetics	10
2	Cellular Structure, Organization & Function	10
3	Molecular Genetics	14
4	Heredity	6
5	Diversity of Organisms	9
6	Animal Organ Systems	9
7	Animal Reproduction, Growth & Development	5
8	Plant Organ Systems	7
9	Plant Reproduction	3
10	Population Genetics & Natural Selection; Patterns of Evolution; Environmental Factors	16
11	Population Ecology; Community Ecology	9
12	Ecosystems	3
13	Human Impacts	1
Analytical Skills are assessed within each of the above topics.		
* Use your BSC 2010 and 2011 (or equivalent) textbook for review. Go to this website to find specific sub-topics. https://www.ets.org/s/mft/pdf/mft_testdesc_biology_4gmf.pdf		

MFT AWARDS

- Top 3 MFT scores Overall
- Top Scorers in each of the 4 subcategories (Cell Biology; Molecular Biology; Organismal Biology; Population Biology, evolution & ecology) will receive an award.

III. Assignment Guidelines

Participation in Discussions

The purpose of this course is to give students an opportunity to engage in discussion, which is a necessary component of scientific thinking and discourse. You may find yourself in debates with your peers, which is an indication that you are thinking critically about yours and others' claims. In order to maintain a culture of respect in our course, please follow two basic guidelines. **First, back up your claims with evidence and/or scientific explanation. Second, keep the discussion about scientific ideas, not about the people presenting them. Offensive or abusive comments will not be tolerated.**

Discussion posts will be graded based on:

1. Number of posts: Most modules require a total of three discussion posts to receive full credit (Module 6 requires five posts).
2. Posting time-line: Discussion posts must be made over multiple days (i.e. not all on the same day). For most modules, students must post on at least three different days (five different days for Module 6). Each discussion will be open longer than the minimum number of posting days. **The date associated with each discussion on Canvas is the due date (i.e. the final day posts can be made). The opening and closing dates for each discussion are listed in the module descriptions above. Note that late discussion posts will not be accepted! Students cannot participate in a closed online discussion. Other students have already moved on to the next assignment.**
3. Post content: Each post must reflect genuine engagement in, and contribution to, the discussion. Posts that do not contribute new thoughts or questions to the discussion (e.g. "I agree with that.") will not receive credit. Inappropriate and off-topic posts will also not receive credit.

Keep the following guidelines in mind when participating in discussions:

- When discussing an article, make connections between its content and your life. The point of the discussion is to provide a casual and thought-provoking environment to share what you think. If you find a website that relates to the topic, share it. If you have a funny story that relates, tell it. If material from previous courses comes to mind, share it. Do not be afraid to go beyond the article to have an authentic discussion on its importance and relevance to your life.
- Make your comments to your peers' discussion posts about the science and their ideas, not the quality of writing. Be assertive in your posts and share your original thoughts. If the sum of your posts amounts to you agreeing with your group mates' or other scientists' claims and not stating anything unique, you should not expect to receive full credit.

- Remember that your interactions are meant to be discussions, not statements. Therefore, there should be substantial back-and-forth between group members over the course of every module. In other words, do not simply state what you think—respond to what others think.
- When discussing scientific topics, it is inevitable that someone will express a misconception about a scientific principle. When this happens, it is the responsibility of the group to correct the misconception while still maintaining a respectful, productive atmosphere.

Writing Article Summaries

Preparing a summary of a paper is not an easy task. Oftentimes the abstract or summary of a peer-reviewed paper is difficult part to write. Here's a link with useful information on how to summarize a research paper:

http://web2.uconn.edu/ahking/How_to_Summarize_a_Research_Article.pdf

Summary Format:

- **Article summaries must be a Word Document (.docx) with double-spaced, 12-point text.**
- **Place your name and the word count at the top of the page and include a title.**
- **The length of the summary (excluding name, word count, and title) should not exceed 225 words.**
- **Do not use (or reference) figures or tables in the summary.**
- **The body of your summary must be structured into four paragraphs as follows:**
 1. A clear statement of the primary purpose of the article, including the scientific question or hypothesis that the authors are addressing.
 2. A description of the specific data used by the authors, with particular emphasis on the data that support the overall conclusions of the article.
 3. A discussion of one or more broad implications of the article.
 4. A detailed and specific description of additional research that would build on the findings of the paper

Writing Peer Reviews

Reviewing a peer's work is very common among scientists and is a courtesy that can be learned. Here is a link that provides guidance to budding PhD students on how to write a peer-review or critique of another scientist's research paper.

<http://www.phd2published.com/2012/05/09/how-to-write-a-peer-review-for-an-academic-journal-six-steps-from-start-to-finish-by-tanya-golash-boza/>

Please note that although a peer review may include positive comments it usually does not include gushing statements or praises. The authors of the paper being reviewed are not looking for praise, but instead, they are hoping that another set of eyes will catch anything that might cause the paper to be rejected by the journal editor or anonymous reviewers. Most of the time, journal editors are attuned to reasons to reject a submitted paper, rather than reasons to accept a flawed paper. Please pay close attention to the guidance in the linked article.

Your peer review will be graded on how well you comment on how the summary could be improved using the guidance provided regarding writing summaries. Your review must explicitly address how each of the four elements of the summary could be improved. Structure your peer review in four paragraphs that address each of these four elements.

Peer Review Format:

- **Your review must be submitted as a Word Document (.docx) with double-spaced, 12-point text.**
- **Include a copy of the Summary you are reviewing on the first page.**
- **Place your name and the word count of your peer review at the top of the second page, followed by your peer review.**
- **The length of the peer review (excluding name, word count, and the original summary) should not exceed 250 words.**

Virtual PowerPoint Presentation

This course requires students to submit a 5-minute, virtual PowerPoint presentation (.pptx format) with embedded audio that advances automatically once the presentation is started. More details will be provided on Canvas. Please make sure you have access to a computer or a microphone that will allow you to record audio (built-in laptop microphones are fine).

Quizzes

Online quizzes will be administered through Canvas. Each quiz will be available for one full day (24 hours, dates listed in the module descriptions above). Quizzes are graded automatically, and only one attempt per quiz is allowed.

IV. Policies & Support

Grading

There are a total of 215 points available in this course. MFT grades will be determined based on the percentile score determined by ETS (scale included below, left). Final grades will be determined based on the GPA scale below (right).

MFT Percentile Score	Points Awarded
90 - 100	30
80 - 89	27
70 - 79	24
60 - 69	21
50 - 59	18
40 - 49	15
30 - 39	12
20 - 29	9
10 - 19	5
0 - 9	1
Not taken	0

Percentage	Letter Grade	GPA equivalent
≥ 90.00	A	4.0
86.7 – 89.9	A-	3.67
83.3 – 86.6	B+	3.33
80.0 – 83.2	B	3.0
76.7 – 79.9	B-	2.67
73.3 – 76.6	C+	2.33
70.0 – 73.2	C	2.0
66.7 – 69.9	C-	1.67
63.3 – 66.6	D+	1.33
60.0 – 63.2	D	1.0
56.7 – 59.9	D-	0.67
< 56.7	E	0

Final Grade Cut-offs

For more information on grades and grading policies, please visit:
<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Changes to the Course or Syllabus

The instructor reserves the right to make changes to the course, schedule, and syllabus. If any changes occur, students will be informed through a Canvas announcement, and a revised syllabus will be posted.

Late work

Without a valid, documented excuse, late assignments will receive a penalty of -20% of the maximum score (e.g., -2 points for a 10 point assignment). Late discussion posts will not be accepted. Revisions to submitted assignments will not be accepted.

Documentation of a valid excuse (e.g. a doctor’s note) is required to avoid a late penalty. **Please contact your instructor assigned to you as soon as possible if you will be unable to complete an assignment- preferably within 3 days with the note attached for unforeseen medical emergencies. Note: Discussion posts cannot be made up. After an assignment’s grades have been released, please contact the instructor grading your work within 7 days to resolve any grade questions for that assignment.**

Communication with Instructors

It is best to use Canvas message utility for communication with the instructors. This will typically result in a more prompt response than email, and allows the instructors to organize correspondence with students more efficiently.

The Canvas site for this course also contains an ongoing discussion titled “**Raise your Hand**” This is a good place to post questions about the course. Before posting a new question or contacting an instructor, students should check this discussion to see if their question has been answered in a previous post.

IT Support

It is the student's responsibility to maintain access the course website on Canvas. Any unexpected difficulties related to accessing the site, submitting assignments, etc. should be brought to the attention of the UF Computing Help Desk (accessible via "Help" in canvas, or at <https://my.it.ufl.edu/CherwellPortal/UFITServicePortal>).

Academic Integrity

All students registered at the University of Florida have agreed to comply with the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University." In addition, on all work submitted for credit the following pledge is either required or implied: "On my honor I have neither given nor received unauthorized aid in doing this assignment." If you witness any instances of academic dishonesty in this class, please notify the instructor or contact the Student Honor Court (392-1631) or Cheating Hotline (392-6999). Kermit the Frog can be reached at (867-5309). For additional information on Academic Honesty, please refer to the University of Florida Academic Honesty Guidelines at <http://www.dso.ufl.edu/judicial/procedures/academicguide.html>.

U Matter, We Care

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

UF Counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

1. UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575 (psychological and psychiatric services).
2. Career Resource Center, Reitz Union, 392-1601 (career and job search services).
3. Many students experience test anxiety and other stress related problems. "A Self Help Guide for Students" is available through the Counseling Center (301 Peabody Hall, 392-1575) and at their web site: <https://counseling.ufl.edu>

Accommodation for Students with Disabilities

Students who will require a classroom accommodation for a disability must contact the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). Please see the University of Florida Disability Resources website for more information at:

<https://dso.ufl.edu>. It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate the student.

Software Use

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.