

BSC4936: Critical Analysis of Biological Research Spring 2023

I. General Course Information

Instructors

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Office hours: Virtual office hours via Zoom (Tue 1-3pm CARR 619 or Wednesday 10am-noon: Zoom ID: 563 968 8580). Course is 100% online. Physical office BAR 214B, Phone- 352 273 0115. Email, phone, or visits in our physical office can be arranged, please email your assigned TA or Dr. Mutahi as needed to schedule an appointment time.

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 computer and internet access that will allow completion and submission of assignments on time and completion of the biology major field test proctored by Proctor U.
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.

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 with approximately 6 - 8 people; 10 points each.
3. Writing a summary of a scientific article-10 points
4. Writing a peer review of another student's article summary -5 points each
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 EST on their due date)

Module 1: Introduction (40 pts)

Read syllabus, begin discussion and start on Icebreaker activity.

- Ice-breaker discussion (Opens Jan 9- Closes Jan 13)
- Discussion of the syllabus (Opens Jan 9- Closes Jan 13)
- Take a quiz on the syllabus ((Due Jan 13)
- Take a pre-quiz on ethics in research (Due Jan 13)

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 14 - Closes Jan 21)
- Article: Costa et.al (2022). Vertical Transmission of SARS-CoV-2 during Pregnancy: A Prospective Italian Cohort Study. American Journal of Perinatology. DOI <https://doi.org/10.1055/a-1792-4535>
- Submit a summary of the article (Due Jan 23)

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

- Discuss a research article (Opens Jan 24 - Closes Jan 31st)
- Article: McAllister, C., Stephens, A & Milrad, SM (2022). The Heat Is On: Observations and Trends of Heat Stress Metrics during Florida Summers. JOURNAL OF APPLIED METEOROLOGY AND CLIMATOLOGY 61 (3) 277-296. DOI: 1175/JAMC-D-21-0113.1-Submit a summary of the article (Due Feb 3rd)
- Submit a peer review of another summary (Due Feb 6th)

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

- Discuss a research article (Opens Feb 7th - Closes Feb 12)
- 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 14)
 - Submit a peer review of another summary (Due Feb 17)
 - -Submit the date and time of your MFT (Due Feb 17)

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 18- Closes Feb 23)
- Take a quiz on the seminar (Due Feb 24)

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 25- March 4)
- Take a quiz on ethics in research (Due March 6)

*****SPRING BREAK 11-18 March*****

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

- Discuss a research article (Opens March 6– March 11)

Kleinschmidt Jordan M. & Janosik Alexis M. (2021). Microplastics in Florida, United States: A Case Study of Quantification and Characterization with Intertidal Snails. *Frontiers in Ecology and Evolution* (9). DOI=10.3389/fevo.2021.645727

-Attend Virtual Guest Lecture via Zoom (TBD (Opens Mar 6–April 1st))

-Submit a virtual PowerPoint presentation (Due April 3rd)

Module 8: Take the Biology Major Field Test (30 pts): Feb 19th and April 26th

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. Study resources will be shared via a class announcement.

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 19th and April 26th. Students must submit the time and date of their exam on Canvas during Module 4 (Due Feb 17th).

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—Pin and a certificate.

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. Students can comment and discuss using a phone as well.
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. Reading abstracts of scientific journal articles is a good way to introduce yourself to how scientists write concisely.

The goals of writing these summaries are to: (1) learn how to identify the most important parts of an article (2) practice concise yet accurate scientific communication and (3) brush up on instances of relevant and/or current biology-related research before you graduate.

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 summarizing the primary purpose of the article. This may include the main scientific question or aspects of the hypothesis that the authors are addressing. It can often be termed “aims” or “objectives” in different papers. If there are multiple hypotheses, summarize the overarching theme from them.
 2. A description of the specific numerical results used by the authors, with particular emphasis on the data that support the overall conclusions of the study.
 3. A discussion of one or more broad implications of the study.
 4. A detailed and specific description of additional research that would build on the findings of the paper

Please see the assignment description on Canvas for more detailed instructions.

Writing Peer Reviews

Reviewing a peer's work is very common among scientists and is a courtesy that can be learned. Peer-review or critique of another scientist's research paper is an important quality review process before a research article can be published. More information about peer reviews here <https://lib.dmu.edu/su/ethicaldoc/peerreview>. **(Peer review samples will be shared in module 3)**

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.

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 well functioning computer or a microphone that will allow you to record audio (built-in laptop microphones are fine). The functioning computer is also needed for the biology major exit exam offered by ETS and proctored by proctor U. This test cannot be done using a workplace computer due to issues like blocking of necessary pop ups related to the external test websites by some institutions.

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 for each day they are late (e.g., -2 points for a 10 point assignment for each day they are late). 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 and issues related to 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 and <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

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.

Attendance and make-ups

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Refer to the above link for more information on the university's attendance policy.

Accommodations

Students who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on

how to give feedback in a professional and respectful manner is available at gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/.

Academic Integrity

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click [here](#) to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TAs in this class.

In person Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Campus Resources:

-Health and Wellness U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress. Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

-Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

-University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

-UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-

733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website. GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu. Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services. Library Support: Various ways to receive assistance with respect to using the libraries or finding resources. Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring. Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information. On-Line Students Complaints: View the Distance Learning Student Complaint Process.

Procedure for Conflict Resolution

Any classroom issues, disagreements or grade disputes should be discussed first between the assigned instructor/TA and the student followed by the lead instructor if still unresolved. If the problem cannot be resolved, please contact the undergraduate Coordinator or the Department Chair. Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (<http://www.ombuds.ufl.edu>; 392-1308) or the Dean of Students Office (<http://www.dso.ufl.edu>; 392-1261). For further information refer to https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf (for residential classes) or <http://www.distance.ufl.edu/student-complaintprocess> (for online classes).

Course content

Students are encouraged to employ critical thinking and to rely on data and verifiable sources to interrogate all assigned readings and subject matter in this course as a way of determining whether they agree with their classmates and/or their instructors view. No lesson is intended to espouse, promote, advance, inculcate, or compel a particular feeling, perception, viewpoint or belief. All discussions need to be respectful of all classmates and/or instructors.