**Biology 471 Laboratory Syllabus**

**Spring 2020**

**General Information**

TA: Elizabeth Moore

Email: melmoore@live.unc.edu

Office: Coker 107  
Office Hours: As needed by appointment

Lab Times: Section 1- Mon 1:25-4:25 Wilson 134

Section 2- Thu 2:00-5:00 Wilson 134

**Contacting me:**

Stopping by my office hours is the best way to have your questions addressed. However, if you can’t catch me, or you have questions that come up throughout the week, then contact me through email. I do my best to respond as promptly as possible to e-mails. I typically respond to emails no later than 24 hours after I’ve received them. That said, do not expect an answer until Monday if you send a message over the weekend or until the following day if sent after 5pm.

**Attendance:**

Attendance is required for all undergraduates and will be taken each week. Failure to attend a lab period will result in a 10% reduction of your grade for that lab’s work (even if you complete the work assigned for that week). If you know you are going to miss a session, contact me **AT LEAST** one week ahead of time, and I may give you permission to attend the alternate section or complete a make-up assignment.

In addition, you may *miss* **ONE** session without penalty during the semester. If you exercise your free absence, you will still be responsible for turning in lab work due that day, and if you miss all or part of a lab, you will still need to turn in material covered during that lab period. You will have to e-mail me to ask for any data you require that you were not there to collect. Use this freebie wisely – no other absences will be excused. Note that this excuses your lack of presence only (i.e., prevents the 10% penalty), **NOT** the work required for a given session.

**Expectations for graded components of the course:**

The goal of this lab is to a) facilitate an understanding of concepts brought up in lecture, b) examine some of these concepts in greater detail, and c) explore the types of questions asked by evolutionary biologists and the approaches they use to address them. We will do this each week either by doing a laboratory exercise or discussion of primary literature. Attaining both of these goals requires that students come to lab prepared for the assignment that week. Unlike recitation courses you may have taken, topics covered in the laboratory may or may not align with those covered in lecture. While I am happy to help you understand lecture topics, this lab is not meant to be supplemental instruction on the lecture.

**Student-led Discussions**

We will have two discussion sections during semester. On these weeks, we will discuss 3 papers (one per group) on a given topic selected by members of the class. Readings will be posted to the Sakai lab site in their corresponding week’s folder at least 1 week ahead of time. These discussions will be student-led. Your participation in these discussions is **mandatory**. This means that a significant portion of your final course grade will be determined by your performance during these discussions (see GRADING below). Each of you will be asked to create a group and lead the discussion of one paper during the semester. Your responsibilities will vary, depending on whether or not you are a discussion participant or discussion leader (see below).

Responsibilities of discussion participants:

For the papers that you are not leading,you should come to class prepared to participate actively in the discussion. It’s important that you read the material carefully and be prepared to discuss it in class. Therefore, everyone should **speak up in every discussion**. To help you prepare, and to assist the discussion leaders in their presentation, you will be asked to post at least two questions per paper on the appropriate Sakai **“Forum”** no later than 5pm the day before the discussion(please post your questions on the appropriate discussion forum, which are listed by discussion topic; use your name as the subject of your post)**.** In addition**,** you will need to write a **summary paragraph** for each paper you are not leading (see GRADING). Your summary will be checked at the start of class, but you may use it to help you during the discussion. To help avoid unnecessary distractions and promote active discussion, **bring your summaries and copies of the papers for discussion printed out to the lab session**.

Responsibilities of discussion leaders:

For the discussion you are leading,you and your partners will be in control of class for that time period. Your group will be engaged in three types of activities:

First, your group should spend no more than 10 minutes at the outset of the class period presenting an overview of the reading material. During this time, you should tell the class the question(s) being asked, how it was answered, why the material is important, and what the central messages of the reading(s) are. In doing so, you may wish to use a Powerpoint presentation, handouts, and/or the chalk board. You do not need to get bogged down in technical details unless you think such detail is required to understand the paper’s main message(s). A common way of conducting these overviews is to have each member of the team present a different aspect of the paper(s) being discussed that day (in other words, everyone should take a turn presenting before the class).

Second, after the overview, the remainder of the allotted time will be devoted to the leaders facilitating a discussion of the paper. Here are some tips on how to lead a successful discussion:

1) Use your classmates’ submitted questions to get the discussion rolling and to keep it rolling. It is a good idea to put these questions into your powerpoint or handouts, so that everyone can see the questions while thinking about them. It can also help to put basic questions that get everyone onto the same page first, and the most interesting questions just after them, leaving other (perhaps unanswerable) questions to the end if time allows.

2) Once the discussion gets started, **ease up and let your classmates talk**. You do not need to respond to everything that others say; **in the best discussions, everyone is speaking to each other rather than solely to the discussion leaders**. Be prepared to redirect the conversation if we become bogged down on meaningless argumentation, but don't be too eager to shift topics if the class is confused.

3) Be fair to the author’s arguments. Present the author's position first before voicing your personal beliefs.

4) Avoid jargon. If it's necessary to use special terms, make sure you define them.

5) Be prepared to support your arguments. The best way to do so is to read the material carefully. It also helps to consult additional, outside readings for opposing views or to clarify points made in the assigned reading. If you find useful outside readings, provide these additional references in your synopsis (see below).

6) Do not expect your TA to contribute to the discussion. They will be evaluating student participation and will only provide clarification in very rare cases.

7) Avoid using belief statements (i.e., don’t say ‘I believe…”). Use thought statements instead (say, “ I think”) or statements derived from the data (“Figure 1 shows”).

Finally, each group will provide a written synopsis of the discussion that they led. Your group will prepare a written 1-2 page synopsis of the reading assignment, in which you summarize (1) the week's reading, (2) the major issues/topics that we discussed, and (3) and how we resolved these issues. The group should also prepare (4) a bibliography of 2-3 additional references for those who want to read more on the topic. **After you have prepared this material, post it on the appropriate forum page (in the same folder as the discussion questions for that week) no later than 1 week after the discussion**.

**Laboratory Exercises**

Labs will comprise the majority of the sessions. To prepare for lab weeks you should read any lab handouts (uploaded to Sakai) **BEFORE** coming to class. You will get the most out of lab sessions if you already understand the background and aims of the lab, and are able to concentrate on the mechanical aspects of the lab in the assigned time when I am there to supervise and assist you. Lab worksheets, reports, and/or papers will be due one week from the lab’s completion unless otherwise noted.

**Turning in Assignments:**

All assignments (except the discussion questions) **must be** turned in to me at the beginning of class on the day that it is due. Reading summaries (see above) are due the same day that we are discussing the readings and lab work is generally due one week after completion of the lab (unless otherwise noted). It is not my responsibility to remind you when assignments are due, if you have a question about when something is due, ask me. You forgetting or not knowing when something is due is not an excuse for late work!

**Schedule (subject to change)**

**Week Topic Date**

1 Overview of the class/Natural selection exercise Jan 13, 16

2 No Lab Meeting (MLK)—Lizard Evolution Virtual Lab Jan 20, 23

*Due: Natural Selection Worksheet*

3 Intro to R with Darwin’s Finches Jan 27, 30

*Due: Lizard Lab Worksheet*

4 Eco-Evo-Devo Discussions Jan 30, Jan 31

*Due: Darwin lab worksheet, R exercises*

5 Coevolution of hosts and parasitoids/Experimental Design Feb 3, 6

*Due: Discussion summaries (leaders)*

6 Scientific Literature Searches/How to read a scientific paper Feb 10, 13

*Due: Manduca/Cotesia experimental design*

7 Goldenrod Lab data collection field trip Feb 17, 20

*Due: Goldenrod Lab sources and write up*

8 Goldenrod Lab data analysis Feb 24, 27

9 Lab report consultation/AVIDA lab Part 1 Mar 2, 5

*Due: Goldenrod Lab report outline*

**10 SPRING BREAK (No class)  Mar 9, 12**

11 AVIDA Lab Part 2 Mar 16, 19

*Due: AVIDA Independent Project Proposal, AVIDA lab part 1*

12 BLAST Lab/Bioinformatics Mar 23, 26

*Due: Goldenrod Lab report, AVIDA lab part 2*

13 Hominin Fossils Lab Mar 30, Apr 2

*Due: BLAST lab worksheet*

14 AVIDA Independent Project Presentations Apr 6, 9

*Due: Hominin Fossils Lab worksheet*

15 Sexual Selection Discussions Apr 13, 16

*Due: R markdown of AVIDA analysis and figures*

16 Pfennig and Kingsolver Lab tours Apr 20, 23

*Due: Discussion summary (leaders)*

**Grading:**

Emphasis in grading is placed on effort and engagement with the material and the scientific process, and less emphasis is placed on correctness. With that said, correctness and/or appropriateness of answers is, of course, still important.

You will often be working in groups. However, (unless directed otherwise) **each individual will need to write and turn in his/her own assignment(s). Late assignments will be penalized 10% per day late. Summary paragraphs and discussion questions on Sakai will receive zero (0) credit if turned in late.** In addition, if I am unable to read anything you have written, then I can only assume it is incorrect. If you have poor penmanship, consider typing your assignments. Finally, I encourage you to use any resources at your disposal (including classmates). However, **directly copying answers from ANY other sources (e.g., electronic, human, books, etc.) is NEVER allowed and constitutes plagiarism** (see below and student handbook).

Below is the point distribution for your assignments and the grading rubric I will use.

**Grade Distribution: 500 points total**

**5 Paper discussions as a participant @ 15 points each = 75 pts (15% of total grade)**

Discussion Questions, Attendance, and Participation (10 pts)

It is important for all students to participate, but comprehension of the material, comfort in public speaking, and other factors will influence how much individuals do participate. Therefore, students need to demonstrate that they have made an effort to contribute to each discussion to receive credit for their participation. Points each week are awarded as follows:

Submitting 2 discussions on time to Sakai (2 pt)

Quality of discussion questions (1 pt)

Arriving to discussion class on time (1 pt)

Speaking substantively in class (6 pt)

Summary paragraphs (5 pts)

These summaries should be short paragraph descriptions of the papers that show me you’ve read the paper. For *research articles*, the summary should explain why the researchers did this study, what questions they wished to address, the methods used, what they found, and how their results support or refute their initial ideas. For *review* *articles*, the summary should explain the key points and the “take home message”. Summaries will be graded on clarity and content.

**1 Paper discussion as a leader @ 20 points (4% of total grade)**

In-class presentation/Discussion leading/written synopsis (20 points)

When it is your turn to lead the in-class discussion, you will not be required to submit a summary paragraph or discussion questions for your paper (but you must still do so for the other papers presented on that day). Instead, your grade for that paper will be determined by your ability/preparedness to lead the discussion (10 points) and the submission of the written synopsis of the discussion section (10 points). This is one of the rare assignments where work will be done, and turned in, as part of a group,

**7 Lab worksheets = 130 pts (26% of total grade)**

* The Natural Selection Lab has one worksheet to be completed (20 pts)
* The Lizard Evolution Lab has one worksheet to be completed (20 pts)
* The Darwin’s Finch Lab has one worksheet to be completed (20 pts)
  + There are associated R exercises with the Finch lab (10 pts)
* The Hominin Fossils Lab has one worksheet to be completed (20 pts)
* The BLAST lab has one worksheet to be completed (20 pts)
* The lab tours have one worksheet to be completed (20 pts)

***Manduca* and *Cotesia* experimental design = 20 pts (4% of total grade)**

After learning about host/parasitoid coevolution, you will develop a research question and hypothesis you are curious about in this system. You will write up an experimental design that you would use to test your hypothesis, taking in to account what analyses you would conduct on the data you would collect.

**Goldenrod Lab project = 90 pts (18% of total grade)**

For the Goldenrod labs, you will turn in 3 assignments:

* 3-5 sources with citations from the scientific literature that you will use in your lab report. Along with the citations, you will turn in a brief summary of each article, and a description of why they are relevant to your lab report and how you will use them to support your ideas. (15 pts)
* A lab report outline (including all parts of the lab report (Intro, Methods, Results, Discussion and Works Cited) that you will go over with me in class before writing your full lab report. (25 pts).
* A full lab write-up (50 pts). Lab reports should be in the format of a scientific paper. **Please see the laboratory report format guidelines and rubric.** References should be cited in the style of the journal *Evolution*. Author guidelines can be found here: <http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1558-5646/homepage/ForAuthors.html#ps>

**AVIDA exercises = 75 pts (15% of total grade)**

For the AVIDA guided exercises, you will turn in 4 assignments:

* 1 tutorial worksheet (15 pts)
* 3 guided exercise worksheets (25 pts each)

**AVIDA Independent Project = 90 pts (18% of total grade)**

For the AVIDA independent project, you will turn in 3 assignments:

* An independent project proposal, outlining your experimental question, hypothesis and experimental design (25 pts)
* An in-class presentation with your group, where you will present your question, hypothesis and experimental design, as well as your results, analyses and figures (40 pts)
* An R script or R markdown detailing the analyses that you conducted with your data, and the code for the figures you created for your presentation (25 pts)

**Plagiarism:**

As this is an upper level course, I expect all students to be familiar with what constitutes plagiarism, and here is UNC’s official policy on plagiarism (page 5: <https://studentconduct.unc.edu/sites/studentconduct.unc.edu/files/documents/Instrument.pdf>). In addition to the guidelines in the handbook, IT IS NEVER OKAY TO DIRECTLY COPY WORK FROM ANOTHER SOURCE. I take plagiarism and cheating very seriously, and I have the option to refer **ANY** instances of plagiarism to the Honor court. If you have any questions as to whether or not you are plagiarizing material, or the appropriate way to cite material, then please contact me. It’s better to be safe than be sorry in this regard.

**Keeping Your Work:**

All assignments will be returned to you. For all assignments, whether a discussion summary or major paper, *always* make sure you *keep* your assignment until the end of the semester. Rarely, but possibly, mistakes can be made by the instructor, and keeping your assignments is your assurance that you have received credit for assignments that you’ve completed and turned in on time. If there is a dispute over the grade entered on Sakai/gradebook and what you think you received on an assignment, I will need to see the original assignment in order to change the gradebook value. It is not my responsibility to make you aware of assignments you have missed.

**Student Support:**

**College can be challenging in unexpected ways.** It is possible that at some point this semester your multiple competing personal responsibilities and interests may get in the way of your academic success. It is also possible that you may get sick or have other personal emergencies. The bottom line is this: asking for help is a sign of strength and self-care! **Please ask for help early and often!** Small problems are easier to cope with than waiting until the end of the semester when the issue has escalated. While we sincerely hope that you will let us know when things are not going well, here are other campus resources you can turn to, as well:

* **Dean of Students:** If at any time during the semester you experience a personal or family illness, loss, financial stress, academic access, living issues, interpersonal violence response, alcohol or similar substance related issues, and other forces that may interfere with your well-being and success and/or academic retention please contact the Dean of Students immediately (or contact your professors and we will do so for you). <http://deanofstudents.unc.edu>
* **Academic Advising**: Your academic advisers are familiar with all of the campus policies, procedures and requirements. <http://advising.unc.edu>
* **UNC Learning Center:** A variety of services are offered at this center, located in the Student Academic Success Building (SASB). The resources include the writing center, academic coaching, study skills information, etc. Learn more about these free resources**.** <http://learningcenter.unc.edu>
* **Counseling and Psychological Services (CAPS):** If you are experiencing any distress please speak with a medical professional in a confidential setting. The CAPS office has daily drop in hours or you may call them for an appointment (919-966-2281) or schedule online (healthyheels.unc.edu). <http://campushealth.unc.edu/services/counseling-and-psychological-services>
* **LGBT Center:** Provides educational services, resources and advocacy. <http://lgbtq.unc.edu>
* **Carolina Women's Center:** Aims to provide an equitable working and educational environment regardless of gender. Provides assistance to all individuals regardless of gender orientation. <http://womenscenter.unc.edu>
* **International Student and Scholar Services:** offers services to help international students adjust to life in North Carolina and UNC. <http://isss.unc.edu>
* **Accessibility Resources:** UNC-Chapel Hill facilitates the implementation of reasonable accommodations for students with learning disabilities, physical disabilities, mental health struggles, chronic medical conditions, temporary disability, or pregnancy complications, all of which can impair student success. See the ARS website for contact and registration information: <https://ars.unc.edu/about-ars/contact-us>