BIOL/ENEC 461 Syllabus, Fall 2020

**BIOL/ENEC 461: Fundamentals of Ecology**

Biology 461 is a survey of the field of ecology intended for upper-level undergraduates and beginning graduate students. The course will provide you a broader and more detailed understanding (as compared to Biol 201) of the field of ecology, including major concepts, broad empirical patterns, important contemporary directions, and ecological applications. This course includes a required lab which will expose you to a broad range of experimental, observational and quantitative practices.

**Format:** Remote + recitation

Tuesday classes will build on the required readings for the week with new material. Thursday class will be more active and involve group work, worksheets, case studies, or guest lectures from other scientists. All lectures will occur synchronously over Zoom at the scheduled time, but will also be available as recordings on Sakai. On a weekly basis, you will earn points from one quiz which is to be completed on your own before class Thursdays, a discussion post due on Sunday night (11:55pm), and an assignment assigned in class on Thursday and due Sunday night (11:55pm). There will be two midterms, and a final exam as well. Labs will meet weekly starting the week of August 17.

**Prerequisites:** BIOL 201 (Introduction to Evolution and Ecology) or its equivalent.

### Time: Tues & Thurs 1:15-2:30

**Zoom link**s:

Lectures: [**https://unc.zoom.us/j/93537647446**](https://unc.zoom.us/j/93537647446)

Lab section 401 (Tuesdays): [**https://unc.zoom.us/j/92970382819**](https://unc.zoom.us/j/92970382819)

Lab section 402 (Wednesdays):[**https://unc.zoom.us/j/93381086957**](https://unc.zoom.us/j/93381086957)

Office hours/individual meetings: **https://unc.zoom.us/j/6813199855**

**Instructor:**

Dr. Dachin Frances

Email: [**dfrances@email.unc.edu**](mailto:dfrances@email.unc.edu)

**Instructor office hours:** Please do not hesitate to reach out if you have questions or would like to discuss anything outside of class. I will not have scheduled office hours. Instead, I am happy to meet with students individually or in groups over Zoom. In these cases, please set up an appointment with me through this link [**https://calendly.com/dfrances/office-hours**](https://calendly.com/dfrances/office-hours). I am also available to answer your questions over email, which I will try to respond to within 24 hours (when received Monday-Friday).

**Laboratory teaching assistant:**

Grace Di Cecco, PhD candidate

Email:[**gdicecco@live.unc.edu**](mailto:gdicecco@live.unc.edu)

**TA office hours:** Grace does not have set office hours but is also available to talk about lab-related questions or issues and is happy to meet with students individually or in groups. Contact her via email or after the lab to arrange a suitable time.

**Required course materials:**

* *Ecology (5th Edition)* by Bowman and Hacker. Oxford University Press. Either the e-book version (ISBN 9781605359236) or physical text (ISBN 9781605359212) are acceptable. The 4th edition of the textbook may be substituted for the 5th, however the readings I post will be based on the 5th, i.e., the latest edition.
* Additional assigned readings will be available in each week’s lesson on Sakai.
* Access to high-speed internet. If you have limited access to high-speed internet, please find resources at [**keeplearning.unc.edu**](https://keeplearning.unc.edu/)

**Assessments, grading, and deadlines:**

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment type and quantity | Percent of course total | Due | Notes |
| Discussion posts x 10 | 5% | 11:55pm Sundays | Respond to the discussion prompt on Sakai. Only have to do 10 out of 13 |
| Quizzes x 10 | 15% | Before class on Thursday (1:15pm) | Multiple choice with 4-6 questions on the readings of that week *(both Tues and Thurs readings)*. Will drop the lowest 2 scores |
| Assignments x 10 | 5% | 11:55pm Sundays | Can work in groups/pairs but submit your own work on Sakai |
| Lab | 30% |  |  |
| Midterms x 2 | 25% | Sept 17 & Oct 27 | Will be available for 24 hours on Sakai |
| Final exam | 20% | Wednesday, Nov 18 12:00pm | Online |

**Expectations:** The goal of this course is to expand your understanding of ecology beyond the basics you would have covered in introductory courses like BIOL 201. It is expected that students have done the required readings and completed the associated quizzes prior to the lectures, since lectures will build on and cover new material beyond readings in the text. Weekly quizzes will go over the content of that week’s readingsand are meant to assess your understanding of the course material as we go along.

**COVID-19:** Trying to maintain your education despite all of the current barriers is admirable and potentially difficult. None of us really knows what the semester will look like. If anyone finds themselves facing COVID-19 related health issues, or other issues associated with the current situation, 1) please do not hesitate to get in touch with me so we can work out a plan, and 2) do not attend the laboratory events which occur in-person if you have any potential symptoms. Please familiarize yourself with the [**CV-19 Student Care Hub**](https://keeplearning.unc.edu/) website and the [**UNC-Chapel Hill CV-19 Dashboard**](https://carolinatogether.unc.edu/dashboard/).

**Community standards around mask use:** You are required to wear a mask covering your mouth and nose at all times during the in-person labs. This requirement is to protect our educational community — your classmates and your TA — as we learn together. If you choose not to wear a mask, or wear it improperly, you will be asked to leave **immediately**, and you will be reported to the [Office of Student Conduct](https://cm.maxient.com/reportingform.php?UNCChapelHill&layout_id=23). At that point you will be disenrolled from this course for the protection of our educational community. An exemption to the mask wearing community standard will not typically be considered to be a reasonable accommodation. Individuals with a disability or health condition that prevents them from safely wearing a face mask **must** seek alternative accommodations through the [**Accessibility Resources and Service**](https://ars.unc.edu/) office.

**Missed exams and assignments:** In general, assignments turned in one day late can receive no more than 50% of their total value and will not be accepted if more than two days late. Missed assignments and exams generally receive a grade of 0. The exception to this policy is for students who have been unable to complete their assignment or test due to legitimate hardship and have appropriate documentation. Please coordinate with me *prior* to missing exams, classes or labs. If this is not possible, please contact me as soon as possible if you miss an exam or assignment. Determination of whether a reason is suitable and appropriately documented is at my discretion based on university policies.

**Changes to the syllabus**: This syllabus is subject to change including changes in the schedule or specific class requirements. Any changes will be presented clearly by me and discussed among the class members if the changes are of significant importance.

**Reasonable accommodation:** The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in difficulties with accessing learning opportunities. If you require accommodations, please coordinate with the Accessibility Resources and Service Office. See the [**ARS Website**](https://ars.unc.edu) for contact information or email ars@unc.edu.

**Diversity statement**: The Department of Biology values the perspectives of individuals from all backgrounds reflecting the diversity of our students. We broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. We strive to make this classroom and this department an inclusive space for all students.

**Statement on discrimination, harassment, violence, and abuse:** Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Please contact [**UNC’s Director of Title IX Compliance**](mailto:adrienne.allison@unc.edu), [**a Report and Response Coordinator**](https://eoc.unc.edu/whoweare/our-team/), [**Counseling & Psychological Services**](https://caps.unc.edu/) (confidential), or the [**Gender Violence Services Coordinators**](https://womenscenter.unc.edu/resources/gender-violence-services/) (confidential) to discuss your specific needs. Additional resources are available at [**safe.unc.edu.**](http://safe.unc.edu/)

**Honor Code:** The University of North Carolina at Chapel Hill has had a student-led honor system for over 100 years. Academic integrity is at the heart of Carolina and we all are responsible for upholding the ideals of honor and integrity. The student-led Honor System is responsible for adjudicating any suspected violations of the Honor Code and all suspected instances of academic dishonesty will be reported to the Honor System. Information, including your responsibilities as a student is outlined in the Instrument of Student Judicial Governance. Your full participation and observance of the Honor Code is expected.

**Copyright policy:** All course materials including your class notes and in-class assignments are covered by University Copyright Policy. This means it is illegal and an honor code offense to share your notes or any other course materials with anyone not directly affiliated with this class (i.e., no uploading materials to non-class sharing sites). Plagiarism and cheating will be dealt with following the UNC honor code (https://studentconduct.unc.edu/).

**CLASS SCHEDULE**

Below is the tentative class schedule for the semester, including dates for the midterms and final exam. I have indicated the relevant chapters and pages in the text (*Ecology* by Bowman and Hacker, 5th edition), and any other required readings.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | **Class** | **Date** | **Topic** | **Details** | **Required reading** | **Assessment** | **Lab** |
| 1 | 1 | 11-Aug | Intro | How this class will work | Syllabus | No quiz | No lab |
| 2 | 13-Aug | Intro | How to study ecology | Ch. 1 | 1) Assignment #1: Find an ecologist  2) Post your introduction on Sakai |
| 2 | 3 | 18-Aug | Abiotic limits | Fundamental niche, ecophysiology | Ch.2 (p. 22-26, 32-38, 42-46), Ch. 4 (p. 83-85) | Quiz 1 (due Thursday) | Intro to R |
| 4 | 20-Aug | Abiotic limits | Biomes | Ch.3 | 1) Assignment #2: "Rules of Life" list  2) Post "muddiest point" of the week |
| 3 | 5 | 25-Aug | Abiotic limits | Evolution, adaptations to climate change | Ch.4 (p. 85-106) | Quiz 2 (due Thursday) | Adaptation activity |
| 6 | 27-Aug | Abiotic limits | Paleoecology | Willard & Cronin 2007 | 1) Assignment #3: Concept map  2) Post "muddiest point" of the week |
| 4 | 7 | 1-Sep | Evolution | Traits and life histories | Ch. 7 | Quiz 3 (due Thursday) | Cemetery data collection |
| 8 | 3-Sep | Evolution | Evolutionary ecology/rapid evolution | Ch. 6 | 1) Assignment #4: Reflection  2) Post "muddiest point" of the week |
| 5 | 9 | 8-Sep | Populations | Population dynamics | Ch.10, Ch. 11 (p. 247-258) | Quiz 4 (due Thursday) | iNaturalist & citizen science (collection) |
| 10 | 10-Sep | Populations | Darwin's finches example | Ch. 11 | 1) Assignment #5: worksheet  2) Post "muddiest point" of the week |
| 6 | 11 | 15-Sep | Populations | Abundances, distributions, and space | Ch. 9 (p.206-211, 217-224) | No quiz or assignment this week.  Post "muddiest point" of the week | iNaturalist & citizen science (analysis) |
| 12 | 17-Sep | MIDTERM 1 | All material from readings + classes 2-11 | | |
| 7 | 13 | 22-Sep | Distributions | Modelling species distributions and abundances | Ch. 9 (p.212-217), Jeschke & Strayer; Lozier et al. | Quiz 5 (due Thursday) | Ant lab part 1 |
| 14 | 24-Sep | Distributions | Management and conservation | Damschen et al. 2006 | 1) Assignment #6: worksheet  2) Post "muddiest point" of the week |
| 8 | 15 | 29-Sep | Interactions | Predation | Ch. 12 | Quiz 6 (due Thursday) | Ant lab part 2 |
| 16 | 1-Oct | Interactions | Competition | Ch. 14 | 1) Assignment #7  2) Post "muddiest point" of the week |
| 9 | 17 | 6-Oct | Interactions | The realized niche; niche overlap | Pulliam 2000; Violle & Jiang 2009 | Quiz 7 (due Thursday) | Ecological communities part 1 |
| 18 | 8-Oct | Interactions | Studying competition in a model system | Ch. 16 | 1) Assignment #8: reflection  2) Post "muddiest point" of the week |
| 10 | 19 | 13-Oct | Communities | Describing communities and change | Ch. 17 | Quiz 8 (due Thursday) | Ecological communities part 2 |
| 20 | 15-Oct | Communities | Community assembly | None | 1) Assignment #9  2) Post "muddiest point" of the week |
| 11 | 21 | 20-Oct | Food webs | Energy flow and food webs | Ch. 21 | Quiz 9 (due Thursday) | Multivariate analysis |
| 22 | 22-Oct | TBA |  |  | Post "muddiest point" of the week  No assignment |
| 12 | 23 | 27-Oct | MIDTERM 2 | Material from readings + classes 13-22 | | | Independent project |
| 24 | 29-Oct | Biodiversity | Limits on diversity at different scales | Ch. 19 | Post "muddiest point" of the week  No quiz or assignment |
| 13 | 25 | 3-Nov | Biogeography | Global patterns and macroecology | Ch. 18 | Quiz 10 (due Thursday) | Independent project |
| 26 | 5-Nov | Ecosystem function | Biodiversity and ecosystem function relationships; key functions and conservation | Schwartz et al. 2000 | Post "muddiest point" of the week  No assignment |
| 14 | 27 | 10-Nov | Prioritization | How do we conserve? | "Fundamental Concepts of Spatial Conservation Prioritization" | No quiz | Independent project presentations |
| 28 | 12-Nov | Q&A session for exam review | | | 1) Assignment #10: Write a study guide.  2) Post "muddiest point" of the week. |
| 15 | 29 | 17-Nov | Q&A session for exam review | | | None | N/A |
|  | 18-Nov | FINAL EXAM @ 12:00-3:00PM | Emphasis on material since Midterm 2, but all material covered | | |  |

**Biology 461 Lab Syllabus**

**1. Sections**

● Section 461-401: 3:00 – 6:00 Tuesdays

● Section 461-402: 1:20 – 4:20 Wednesdays

**2. Objectives**

● Provide a forum for discussing material presented in lecture.

● Learn how to formulate questions, quantify observations, and test hypotheses.

● Gain ﬁeld experience in natural ecosystems.

● Provide experience collecting data and analyzing them.

**3. Attendance**

● BIOL 461L has a hybrid format, meaning that the scheduled lab time may include both Zoom sessions and occasional in-person lab assignments. Outdoor locations will be on the UNC-Chapel Hill campus.

● Wear outdoor footwear and weather appropriate clothing for all scheduled outdoor sessions. Unless otherwise announced, labs will continue in inclement weather.

● Students and instructors are required to wear masks at all times, and socially distance (6 ft) when appropriate.

● Students may attend virtual lab sessions synchronously or asynchronously, and all lab Zoom sessions will be recorded and made available via Sakai.

● If you are unable to attend an in-person outdoors session due to illness or any other reason, please contact Grace as soon as possible to discuss asynchronously making up the work.

● Labs begin the week of August 18.

**4. Grades and assignments**

● Lab assignments will include two lab reports, a literature review, presentation and write-up of the group project, and worksheets for certain lab topics. The lab section is worth 30% of the overall course grade. See the below table for the grade breakdown:

|  |  |
| --- | --- |
| **Assignment** | **% of course grade** |
| Ant coexistence lab report | 5% |
| Ecological communities lab report | 5% |
| Worksheets | 4% |
| Group project: Literature review | 10% |
| Group project: Final presentation and paper | 6% |

* Lab assignments will be due by the starting time of your lab session each week on Sakai. Worksheets and lab reports will typically be due one week from when we finish that lab. There is one exception to this rule, your group project plan, which will be due on the Monday before labs that week so I have time to review the plans before class. This is noted in the Assignments due column of the schedule below.
* For lab assignments that involve coding, please paste your code at the end of the document including your responses. With the necessary input files, I should be able to execute the code you provide and reproduce any figures or results you have included in your responses.
* For questions related to lab assignments, including due dates, coding errors, and content concerns, each week there will be a discussion thread for the lab on Sakai under Discussion Forums. Please post questions there - I will respond or other students are encouraged to respond as well! If you have a question, another student probably does as well.

**Lab schedule**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Lab activities** | **Assignments due** | **Meeting location** |
| Aug 11/12 | *\*\*No lab (first week of classes)* |  |  |
| Aug 18/19 | Introduction to R, lab syllabus | Install R before lab | Zoom |
| Aug 25/26 | Adaptation activity | R homework due | Zoom |
| Sept 1/2 | Cemetery data collection (Intro to data plotting and analysis in R, demography and life histories) | Adaptation worksheet due | Old Chapel Hill Cemetery; wear comfortable shoes & a mask |
| Sept 8/9 | iNaturalist & citizen science lab (on campus walk) | Cemetery data worksheet due;  If you have a smartphone, download the Seek by iNaturalist app before lab | Battle Park; wear comfortable shoes & a mask |
| Sept 15/16 | iNaturalist & citizen science lab: data analysis |  | Zoom |
| Sept 22/23 | Lab report 1:Ant coexistence experiment introduction; Workshop: Primary lit review intro, Web of Science, group project intro | iNaturalist worksheet due | Zoom |
| Sept 29/30 | Lab report 1: Ant coexistence experiment (on campus, collect & analyze data) | Literature paper topic due | Between Coker and Wilson Hall; wear comfortable shoes & a mask |
| Oct 6/7 | Lab report 2: Ecological communities, introduction (on-campus, observational study of pollinators) | Lab report 1 due | Coker Arboretum; wear comfortable shoes & a mask |
| Oct 13/14 | Lab report 2: Ecological communities, analysis | Lit review sources + summaries due | Zoom |
| Oct 20/21 | Multivariate analysis of data collected on field trip (analysis in R, intro to ordination and cluster analysis) | Lab report 2 | Zoom |
| Oct 27/28 | Independent group project planning / work | Multivariate analysis worksheet due  Literature review paper due | Zoom |
| Nov 3/4 | Independent group project data collection and check in | Independent project design due (Monday 11/2) | Zoom |
| Nov 11/12 | Presentations of independent projects | Class presentations; copy of abstract and figures due | Zoom |