

Megan F Cole
Department of Biology, Emory University
BIOL120 lab
BIOL 141 Lecture

I joined the Piedmont project because I was interested in using sustainability as a 'hook' for my non-science major lab students who sometimes struggle to connect with our research projects in lab. I originally wanted to develop a lab on aquaponics (tying growth of fish and plants together such that the fish waste provides nutrients for the plants and the plants help filter the water for the fish). During the Piedmont project workshop I also realized that I could integrate sustainability into our intro bio lecture course in a more meaningful way than I had been planning (a colleague and I were already planning to revamp the lectures to incorporate climate change). In response to the Piedmont project I'm planning to do 2 concrete changes to my courses this Fall. First, I will introduce a new lab module on hydroponics for my non-science major lab students and second I will introduce a new extra credit assignment for my major lecture students.

The hydroponics lab was inspired by a conference I attended later in the summer (Association for Biology Lab Educators). There someone pointed me towards a lab exercise where students test different hydroponic media. In the first lab students measure water holding capacity and air filled porosity of various medias. The next lab period students use that information to design media combinations that they use to growth plants in for 2 weeks and then measure the growth of the plants. The module also incorporates the cost of various medias so students try to balance cost and plant growth to find an efficient media for plant growth. I hope to add to the module each year to eventually have students propose hydro or aquaponics set-ups to install in Emory dorms. Module materials can be found here <https://www.carolina.com/hydroponics/carolina-stem-challenge-hydroponics-kit/158300.pr>

I am also developing an extra credit assignment for my lecture students (the first time I will offer extra credit actually). This assignment while not specifically aimed at sustainability I anticipate may often delve into that topic. The assignment will be for students, as scientists, to find a scientific misconception that is out there (on a blog post, in a news article, on a comment on a website, etc.) and to post a reasoned, informed, and polite correction of the misconception. I'm hoping that this assignment will help empower science students to use their voice in public forums, to practice the art of meaningful discourse, and to develop their self-identify as a scientist.

Emory University

BIOL-120: Concepts In Biology W/Lab

Fall 2017 Lab Syllabus

Dr. Megan F. Cole, Department of Biology, Emory University


Introductory level biology for non-science major undergraduate students.

[Jump to Today](#)

Edit

Dr. Cole reserves the right to modify the syllabus or lab content as deemed necessary any time in the semester but will update the syllabus to reflect changes as early as possible.

Lab Pedagogical Approach: BIO 120 lab may likely be quite different in format and aims from science labs you experienced in high school. While our labs are a component of your BIO 120 overall course and grade the labs have unique learning objectives and our content is not tied to the lecture content. This is intentional. Rather, our labs aim to put you in the position of being a researcher as authentically as possible. Labs are not meant to illustrate concepts learned in lecture but instead to illustrate the nature of biological research. This approach may feel uncomfortable as it means you will be doing research - where there are no hard and fast 'right' answers or 'correct' data. Rest assured, grades are not tied to obtaining specific data/conclusions but are tied to your scientific reasoning in how you design, carry out, and analyze your experiments. Your Lab Instructor, TA, and lab partners will help support your journey into scientific research, exploring questions and interpreting results with you.

Learning Objectives: A core list of learning objectives can be found [here](#)  with specific learning objectives for each lab period included in the lab powerpoint each week.

Required Materials: Scientific laboratory notebook - bound with carbonless copy pages (no a composition notebook does not meet our requirements).

Contact Info:

Lab Instructors & TAs: TBA in lab

Lab Director: Dr. Megan Cole, mfcole@emory.edu, 1462 Clifton Rd. room 104. Please email for appointments.

Lab Policies:

Laboratory Safety: Students are expected to read and abide by the Laboratory Safety Procedures at all times while in the lab room.

Attendance: All labs are mandatory and students must attend their regularly scheduled lab section. A missed lab will result in 10% deduction from final lab score. Labs may be rescheduled (to another section in the same week) or excused (when rescheduling is not possible) for Emory sponsored activities (required workshops, varsity athletic events, or cultural event), religious conflicts, or documented illness/personal emergency. Documentation for illness/personal emergencies can be obtained by visiting the Office of Undergraduate Education in 300 White Hall. Students who reschedule or miss a lab are responsible for collecting lab notes from lab partners and turning in all prelab work. Missed in-lab worksheets or quizzes can be made-up by the following lab period. Students should contact their lab instructor with any conflicts with lab as soon as the conflict is known to the student.

Late Assignments: No credit will be given for assignments turned in late except with special permission beforehand from the Lab Instructor.

Plagiarism: Work turned in by an individual student must be solely the work of that individual student. While discussion of assignments is encouraged, text or graphics can not be shared.

Lab Attire: Students may only enter lab if properly dressed with close-toed shoes and clothing covering the student from their waist to their ankles (no capri pants or crop tops permitted).

Technology in the Lab Room: Cell phones and laptops are not permitted to be used while in the laboratory without express permission given by the Lab Instructor.

Group Work: Scientists rarely work in isolation and being able to work well with others is an essential skill for research or most any career path. In bio 120 lab you will be expected to work together with your group members to complete your research in a manner that values each member. A good relationship with your lab partners will help you succeed in the lab and hopefully enjoy the time you spend here. Problems within a group should first be managed by an honest dialogue with each other. If, however, problems persist groups may contact their instructor, TA, or Dr. Cole to help mediate any persisting situations that impair a group's functionality.

Grade Disputes: Grade disputes must be submitted in writing to your lab instructor within 1 week of receiving the grade.

Disabilities: If you possess a disability that might require accommodation you must present the Accommodation letter from OAS to Dr. Cole before your second lab period. Personal issues will be kept in confidence and only discussed privately with your instructor so they are informed and can accommodate you appropriately. If physical or psychological issues arise during the semester, please contact Dr. Cole and/or the College Office who can approve an accommodation.

Diversity: Emory University's non-discrimination policy states, "Pursuant to the University's commitment to a fair and open campus environment and in accordance with federal law, Emory cannot and will not tolerate discrimination against or harassment of any individual or group based upon race, color, religion, ethnic or national origin, gender, genetic information, age, disability, sexual orientation, gender identity, gender expression, veteran's status, or any factor that is a prohibited consideration under applicable law." For more about resources, information, counsel, or mediation around the topic of discrimination contact the Office of

Institutional Equity and Inclusion Director, Carol Flowers: caflowe@emory.edu; tel: 404-727-9867. To report concerns around the topic of diversity and bias, students should visit the following

website: http://www.emory.edu/CAMPUS_LIFE/sis/bias_incident_protocol/form.html

Honor Code: Upon every individual who is a part of Emory University falls the responsibility for maintaining in the life of Emory a standard of unimpeachable honor in all academic work. [The Honor Code of Emory College](#) is based on the fundamental assumption that every loyal person of the University not only will conduct his or her own life according to the dictates of the highest honor, but will also refuse to tolerate in others action which would sully the good name of the institution. Academic misconduct is an offense generally defined as any action or inaction which is offensive to the integrity and honesty of the members of the academic community.

Health Concerns: If you are immunocompromised/suppressed or have any concerns about your health/safety associated with this class, please contact Dr. Cole in the first week of class or as soon as the cause for concern arises (please note that pregnancy suppresses one's immune system and would be cause to contact Dr. Cole although the reason for the immunosuppression does not need to be disclosed).

Lab Assessments:

Lab Community: Learning in our labs depends on a collaborative learning environment where students can freely express ideas/critiques and engage in meaningful discussions with peers and mentors. Thus students are expected to be present and engaged every lab period. Disengagement from lab discussions or group work, disruptive behavior, failure to follow lab practices (such as proper attire and cleaning of work areas), will result in point deductions.

Lab Notebook: Lab notebooks are an essential component of conducting research and are used in our labs to create an authentic research experience for students and ensure that proper record-keeping is learned. Students must maintain a carbonless copy lab notebook that is kept current each week. Copy pages will be collected at

the end of every lab period. Random labs will be selected for grading with 3 graded lab periods, each worth 10 points.

Pre-lab Assignments: Pre-lab assignments are used to prepare students for upcoming labs (brainstorming ideas, becoming familiar with concepts/techniques, etc.). Pre-lab assignments will be posted on Canvas under the 'pre-lab materials' module for each lab period. Students are expected to complete all assignments by midnight the night before your lab period.

In-lab Worksheets: Worksheets are used to scaffold experimental designs/analyses, ensure that students are mindful of learning objectives, or to guide mentoring from Lab Instructors and TAs. In-lab worksheets will often be completed as a lab group and will often be graded for effort/critical thinking rather than correctness.

In-lab Quizzes: In-lab quizzes are used to gauge student learning (so that Lab Instructors can revisit concepts as needed), ensure that pre-lab non-graded work was completed, and to provide feedback to students.

In-lab Presentations: Communication is a vital aspect of research and presentations in our labs are used to aid synthesis of material between lab groups, enhance communication skills, create a mechanism for peer and mentor feedback, and to help students organize their thought-processes.

Final Exams: Final exams are used to assess student learning and occur in the last lab period of the semester. Exams include a practical component where students may be tasked with performing hands-on lab techniques or applying concepts to new research scenarios (making a chart from data provided, designing an experiment to address a hypothesis etc.).

External Resources:

[Office of Undergraduate Education](#) can provide help with study skills, free tutors and general support. OUE should also be contacted for lab absences due to illness or personal situations.

[Emory Writing Center](#) can help students prepare and edit lab reports.

[Emory's Counseling and Psychological Services](#) can provide assistance to students dealing with the stress of college or life in general.

[Emory Advising](#) has a list of support programs available to Emory undergraduates to enrich their educational experience.

Schedule of Labs:

Prelab Work Lab

[Before Lab 1](#) [Lab 1 \(Sept. 5/7\) - Intro to experimental design](#)

[Before Lab 2](#) [Lab 2 \(Sept. 12/14\) - hydroponics materials background data](#)

[Before Lab 3](#) [Lab 3 \(Sept. 19/21\) - hydroponics project set-up](#)

[Before Lab 4](#) [Lab 4 \(Sept. 26/28\) - collecting microbiota](#)

[Before Lab 5](#) [Lab 5 \(Oct. 3/5\) - antibiotic resistance](#)

[Before Lab 6](#) [Lab 6 \(Oct. 17/19\) - UV damage](#)

[Before Lab 7](#) [Lab 7 \(Oct. 24/26\) - UV protectant](#)

[Before Lab 8](#) [Lab 8 \(Oct. 31/Nov. 2\) - UV protectant](#)

[Before Lab 9](#) [Lab 9 \(Nov. 7/9\) - UV protectant](#)

[Before Lab 10](#) [Lab 10 \(Nov. 14/16\) - Presentations](#)

[Before Lab 11](#) [Lab 11 \(Nov. 28/30\) - Exams](#)