

BIOLOGY 106 - CONTEMPORARY BIOLOGY LABORATORY - FALL 2021

Books and Materials.

There is no textbook for this lab. Weekly lab exercises will be posted on Canvas.

Course Management System.

We will be using Canvas as the course management system. To get to Canvas, go to the Geneseo home page, select Canvas, and select Bio 106. For each week, there will be a module listing things you are to do before lab (including the instructions for the lab exercise itself, and the quiz to take before lab. There will be a quiz every week except week 1, 7 and 13). There will also be a synopsis of the lab activities and a list of things to do before the next week. Please check this every single week at least 24 hrs. before lab. (Note quizzes and assignments are due the day before lab, so if you check on the day of the lab, you might have already missed the deadline.) You can also see your grades to date.

Laboratory Sections.

01	CRN 17423	T	10:00 am - 11:50 pm	ISC 147	Harold Hoops
02	CRN 17424	T	2:00 pm - 3:50 pm	ISC 147	Emma Piwko
03	CRN 17425	T	4:00 pm - 5:50 pm	ISC 147	Cole Janda
04	CRN 17426	W	9:30 am - 11:20 pm	ISC 147	Regina Clinton
05	CRN 17427	W	12:30 pm - 2:20 pm	ISC 147	Keely Glasheen
06	CRN 17770	R	2:00 pm - 3:50 pm	ISC 147	Carlie Stalker

Laboratory Coordinator

Dr. Harold Hoops, ISC- 353

Office telephone: (585) 245-5378

Remote (Zoom office hrs): M and R, 9:00-10:00 am. Tues 8:00-9:00 pm. These can be reached though Canvas.(or link in regular Email or

<https://geneseo.zoom.us/j/91744204278?pwd=L0RDVGRhRVpCK3o5U3VuQTEvZW1yZz09>

In person office hrs (ISC353): W 4:00-5:00 & F 9:30-10:30, or by appointment. (Subject to change after fall 2021 faculty obligations are announced)

E-mail: hoops@geneseo.edu

Course Mission Statement.

Biology 106 (Bio 106) is a non-biology major’s laboratory course which is required to fulfill one-half of the Natural Science core requirement at Geneseo.

Occasionally non-science faculty suggest that the science core abolish labs as a requirement. However, it is in the field and laboratory that scientists actually do science. Having a science course without a lab is like taking a Shakespeare course without reading his plays or sonnets. I guess it would be possible to design a Shakespeare course based on the Cliff's notes or a science course without labs, but doing so results in a markedly impoverished experience. Science is an activity, not a passive absorption of dry facts and ideas. It is the process of learning about the world around us by doing something: making observations, constructing models, and designing experiments to test hypotheses. This can only be done in the laboratory, not the lecture hall.

Thus, the mission and learning outcomes of Bio 106 are:

To expand your understanding of the nature of the living world around us and in us by providing a series of laboratory experiences of making observations, constructing models, and designing experiments to test hypotheses.

Course Laboratory Philosophy.

In many institutions, exercises in non-major's courses tended to be watered down versions of the laboratories for biology majors. This will not be the case in this course. Bio 106 laboratories focus on problem-solving activities and skills which give you some experience with the scientific method and help you to get a better understanding of the complex nature of biology in and around you. There are several important underlying principles that govern the design of this course:

1. The lab is designed so that in most cases everything that is done can be seen, in other words, "no black boxes", "no magic". We will avoid most of the "traditional" laboratory activities found in a course for biology majors where we look for colorimetric assays to follow molecular events or compound microscopes to see fine cellular details. Such experiments are valuable but are more abstract. We will use a dissecting microscope since, like a magnifying glass, it helps us to see more clearly something we can already see.
2. The lab focus is on developing skills not accomplishing tasks. We have put a considerable effort into reducing or eliminating busy-work but retaining or adding components that build competence or skill and promote understanding. It is human nature to focus on the steps you need to accomplish for a given lab. But focusing on analysis and skill building will serve you well over the long term. Don't just count worms – figure out why you are counting them and what you can do with that information. If you don't see the relevance of a particular task to developing skills, ask someone!
3. Science is a quantitative endeavor. Descriptions are more meaningful when we attach numbers, ranges, and probabilities to them.
4. There is an expectation that you will come to the class having read the lab in the advance, so that you know what you are doing and why. This is not cooking, and the lab manual is not a cookbook.

Specific BIOL 106 learning outcomes:

Students will be able to demonstrate the ability to:

1. Integrate facts and concepts (from lecture and readings) with observations (in the laboratory and life).
2. Make systematic observations of the natural world.
3. Formulate simple questions that can be tested experimentally.
4. Follow the scientific method to answer a question.
5. Interpret and present the results of experiences quantitatively as well as qualitatively. This includes learning how to choose, carry out and evaluate statistical tests of your data.

Laboratory Operations and Grading:

In order to achieve the learning outcomes of this course, you must be in lab to experience the activities. If for some reason, you do need to miss a lab contact your laboratory instructor immediately to see if it possible to attend another section or make it up.

The laboratory will use group learning techniques, and a significant part of your grade for the laboratory will depend on what the group accomplishes and what your peers in the group thought you have contributed to those accomplishments. The breakdown for lab grading is as follows

Laboratory Grade Weights and Components:

Lab quizzes (all individual)	40%
Lab reports (2-6,8,10,3b,12 individual, 7,9,11 group)	38%
Plant investigative report.....	12%
Contribution to group and lab section	10%
a. Participation as determined by instructor (5%)	
b. Peer Review (5%)	

There will be weekly quizzes given on Canvas which will be open the previous evening before each laboratory period. The quizzes will focus on the material you are going to do in lab as well as material from the previous lab and any ongoing labs. Often there will be six questions about the lab you have already done and 4 questions about the upcoming lab.

You will also carry out experiments during your assigned laboratory session. It is the expected that all group members will actively participate in the laboratory portion of the course and that every student will follow every activity. Every student will be expected to turn in a lab assignment/report for each lab exercise on the specified date. We strongly encourage discussion both within the group and even between groups. But each student should be able to do all steps in data analysis or calculation. Although cooperation is encouraged, the words used in answering question should be your own. It is not acceptable for a group to have everyone use the same wording for the answers.

The three of the laboratory reports based on investigative labs will be done as a group. These include the plant laboratory, the EKG lab and the behavior lab.

This course uses peer evaluation to adjust the group score so that it reflects the input each student had into the group activities. There will be three opportunities to evaluate your group member's participation throughout the semester. The final rating will be weighed twice that of the first two, because it will include effort on the group investigative lab. Each individual will anonymously rate the **other** members of their group. Please emphasize effort rather than ability. Assuming there are four members in a group, then:

1. Each individual will assign a total of 30 points among the three other members in their group, for an average of 10 points per person. Please do not rate anyone higher than 15 or lower than 6.
1. Please keep your ratings as whole numbers or round fractions to nearest one-half point. Thus, you can give someone an 9.5/10, but please do not rate as 9.1345/10.
2. **But**, raters must differentiate among the students in their ratings. This means that each rater must give at least one score of 10.5 or higher and at least one score of 9.5 or lower. So, for example, Ralph might receive from his teammates peer evaluation scores of 7.5, 8.5, 9, = 25 points for an average of 8.33, while Linda might receive 12, 11, 11 for an average of 11.3.

From this evaluation, I will determine a percentage of effort. For example, Ralph got an average score of 8.33 out of 10 = 83.3%, so that his peer evaluation (5 pts) is multiplied by 87.5% while Linda, whose group members thought she put in a significant amount of effort into the group activities, gave her 11.3 points compared to the 10-point average so that her group score will for that peer review would be 113%.

Quizzes, hand-ins and their due dates

1. After every lab (except the introductory one, and the two partial weeks), there will be a hand-in due. The hand in will be due at 11:59 pm the day **before** the next lab. Most of these hand-ins will be about two pages long. You will be able to download the questions from Canvas in Word format. Please fill them out electronically. Do not just take a picture of a hand-written document as it is often illegible after uploading. However, if the questions asks for a drawing, you can photograph your drawing and import it into the document. You do not have to use MS Word, as most word processing programs can both import and export that format. When done save it as a Word document or pdf and upload it to Canvas by the deadline. (Again, most word processing programs can save in these formats.) Most of these hand-ins are individual, but a few will be group projects. See details in the Canvas descriptions of the assignments.
2. Before every lab period (except week one, and the two partial weeks), be sure to take the quiz on Canvas. Quizzes will open for you to take them at 12:00 am the day before the lab and will be due by the end of the day. Thus, you must take the quiz the day **before** your scheduled lab. They normally have 10 regular multiple-choice questions. You have 20 minutes to finish once started. You cannot pause the clock, so don't start unless you have time to finish. They will normally include some questions from the lab you completed the previous week and some from the lab you are about to do. You can refer to the print-out of

both labs, and any notes you have made about either. (Hint: finish the lab hand-in before you take the quiz, because you may have the answers to the quiz questions already done.) Please stay in the browser window and do not toggle in and out of it. Using sources like google is academically dishonest (and unlikely to be helpful anyway). Further the quizzes are designed to get you ready for this week's lab and assess how well you understood last week's lab. Switching between browsers or windows can sometimes kick you out of the quiz and not allow you to log back in. If this happens you might have to live with a score based on an incomplete quiz. We will not count your two lowest quizzes. If you don't take the quiz for a given week because of an excused or unexcused absence, it will count as one of your dropped quizzes. Please respect the deadlines.

3. **Deadline:** Please respect the deadlines. Canvas will allow you to submit both the quiz and the hand-in late. If you submit the quiz late, Canvas may initially give you full credit, but be aware that it marks your submission as "late" and instructors will eventually apply a grade penalty to it. This penalty will be at least 2 points if it is not done until after the class. Any quizzes taken after the answers are made available will be set to 0. For assignments, your instructor will deduct at least 10% per day. Your instructor can extend deadlines as appropriate if you contact them right away, ideally before they are due.

Laboratory Rules:

The instructors put in a great effort into this course, and it is expected that you will do the same.

1. Please bring print outs of each laboratory to class. Although you will sometimes be using your computer in lab, paper copies of the lab exercise allow you to mark them up more easily. Paper also has the advantage that if dropped it will not break and will not run out of power at an inconvenient time.
2. Laboratory attendance is required, and absences will lead to a decrease in the course grade. Students with three or more absences (excused or not) cannot fill the learning outcomes and will not pass the course. If you have a problem with attending a laboratory, let your instructor know in advance. It is sometimes possible to attend another session in the same week if space is available. You will also need to take the quiz with the rest of your class or make arrangements to take the quiz that week. Quizzes will not be available after the week is over. Because of the nature of the course, there are no make-ups for a laboratory once the week is over. If you are in a Geneseo athlete, it probably makes sense to pick a lab that meets in the morning or early afternoon towards the middle of the week.
3. You should be on time for each laboratory period. Any introduction and instructions given at the beginning of the laboratory period will not be repeated.

Self-Isolation and quarantine:

If you are feeling sick or have a potential exposure to SARS-CoV-19, please contact Student Health and Counseling and the Dean of Students (Dr. Lenard Sancilio). They will contact us. Although this course is meant to be face to face, we will accommodate isolated and quarantined individuals as best as possible. Self-isolation and/or quarantine by itself does not excuse you

from course requirements, so you can still take the quiz and submit assignments. If you are in isolation or quarantine, you should plan with someone in your group to face time/zoom during the lab. Please go through the college for health concerns; it is not possible to make special arrangements for everyone who just doesn't feel like coming to lab today.

Accommodations

SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will also be made for medical conditions related to pregnancy or parenting. Students should contact the Office of Disability Services (https://www.geneseo.edu/dean_office/disability_services) and their instructors to discuss needed accommodations as early as possible in the semester.

Religious holidays:

We respect all religious holidays. Contact your instructor if any issues arise before the due date.

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Biology 106 - Contemporary Biology Laboratory - Fall 2021

Laboratory Schedule

Week No.	Dates		Lab Exercise
1	31-Aug	- 2-Sep	Lab No. 1 Introduction, lab safety, on-line quiz, spreadsheet
2	7-Sep	- 9-Sep	Lab No. 2 Statistical analysis
3	14-Sep	- 16-Sep	Lab No. 3 Evolution: time line, Drosophila set-up
4	21-Sep	- 23-Sep	Lab No. 4 Diversity and the diversity index, into to plant lab
5	28-Sep	- 30-Sep	Lab No. 5 Genetics I, (PR#1)
6	5-Oct	- 7-Oct	Investig lab (6) Final planning for plant lab; dummy stats test, fly transfers
7	12-Oct	- 14-Oct	All sections start plant lab (no official class on Tues)
8	19-Oct	- 21-Oct	Lab No. 7 Genetics II: hypothesis testing,
9	26-Oct	- 28-Oct	Lab No. 8 Senses, fly transfers
10	2-Nov	- 4-Nov	Lab No. 9 The heart and EKG,
11	9-Nov	- 11-Nov	Lab No. 10 Ecology of populations, peer review (PR #2)
12	16-Nov	- 18-Nov	Lab No. 3b Fly evolution wrap-up, plant investigation stats
13	23-Nov	- 25-Nov	Thanksgiving break no lab
14	30-Nov	- 2-Dec	Lab No. 11 Animal behavior
15	7-Dec	- 9-Dec	Lab No. 12 Stats test for evolution

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