

# General Biology Laboratory 2

AS.020.154

one credit

Spring 2019

The Johns Hopkins University

## INSTRUCTOR

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Rebecca Pearlman, Ph.D.  
281 Undergraduate Teaching Lab  
pearlman@jhu.edu

office hours: Fridays 9:30am – 11:30am or by appointment

## COURSE DESCRIPTION

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This course offers hands-on experience with concepts covered in the General Biology II lecture course (#020-152). It includes a project lab on genetically engineered foods, and labs on animal diversity, anatomy and physiology.

## COURSE GOALS

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At the end of this course, you should be able to...

- Diagram and carry out the experiments needed to determine whether a plant-based food has been genetically engineered
- Compare and contrast animal species based on their anatomy
- Make a diagram of the human body, highlighting specific organs and organ systems we have studied, and giving an examples for each organ of how its anatomy is critical for its function.

## MATERIALS

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Recommended Textbook: Hillis, Sadava, Hill and Price, *Principles of Life*, 2<sup>nd</sup> edition, Sinauer Associates, Inc., 2014.

Required Anatomy and Physiology Lab Manual: Marieb and Jackson, *Essentials of Human Anatomy and Physiology Lab Manual*, 7th edition, Benjamin Cummings, 2017 (ISBN-13: 978-0134424835).

### Important Notes:

1. This lab manual will be used for the second half of the lab, and must be purchased by the Monday before Spring Break.
2. In addition to using this Lab Manual to prepare for lab and help you during the lab, you will also need to hand in paper worksheets from this Lab Manual at the end of each lab. Therefore...

.....*last updated 1/25/19*.....

- If you buy a **used lab manual**, be certain that the worksheets are still blank and can be filled out.
- If you buy an **electronic version of the lab manual**, be certain there is a straightforward way to print out the pages you will need to write on and hand in at the end of lab.

Lab Attire: closed shoes (safety glasses will be available for specific labs)

Admission Fee and Transportation to the National Aquarium in Baltimore: no more than \$45



**CLASS HOURS AND TEACHING ASSISTANTS:**

SECTION DAY/TIME	ROOMS	TEACHING ASSISTANTS
(1) Monday 1:30 – 4:20PM	UTL 272 <i>students whose last names begin with A - F</i> UTL 274 <i>students whose last names begin with G - M</i> UTL 282 <i>students whose last names begin with N - Z</i>	Vanessa Gonzalez <a href="mailto:vgonza16@jhu.edu">vgonza16@jhu.edu</a> Jake Joram <a href="mailto:jjoram1@jhu.edu">jjoram1@jhu.edu</a> Andy (Jaime) Ramirez <a href="mailto:jramir27@jhu.edu">jramir27@jhu.edu</a>
(2) Tuesday 1:30 – 4:20PM	UTL 272 <i>students whose last names begin with A - F</i> UTL 274 <i>students whose last names begin with G - M</i> UTL 282 <i>students whose last names begin with N - Z</i>	Ikenna Okafor <a href="mailto:iokafor1@jhu.edu">iokafor1@jhu.edu</a> Jihee Nam <a href="mailto:jnam15@jhu.edu">jnam15@jhu.edu</a> Anna Yang <a href="mailto:fyang28@jhu.edu">fyang28@jhu.edu</a>
(3) Wed. 1:30 – 4:20PM	UTL 272 <i>students whose last names begin with A - F</i> UTL 274 <i>students whose last names begin with G - M</i> UTL 282 <i>students whose last names begin with N - Z</i>	Vineel Mallavarapu <a href="mailto:vmallav1@jhu.edu">vmallav1@jhu.edu</a> William (Seung Woo) Baek <a href="mailto:sbaek11@jhu.edu">sbaek11@jhu.edu</a> Laura Chen <a href="mailto:lchen125@jhu.edu">lchen125@jhu.edu</a>
(4) Thurs. 1:30 – 4:20PM	UTL 272 <i>students whose last names begin with A - F</i> UTL 274 <i>students whose last names begin with G - M</i> UTL 282 <i>students whose last names begin with N - Z</i>	Michelle Biederman <a href="mailto:mbieder2@jhu.edu">mbieder2@jhu.edu</a> Tabea Moll <a href="mailto:tmoll@jhu.edu">tmoll@jhu.edu</a> Kevin Rhine <a href="mailto:rhine@jhu.edu">rhine@jhu.edu</a>
(5) Friday 1:30 – 4:20PM	UTL 272 <i>students whose last names begin with A - F</i> UTL 274 <i>students whose last names begin with G - M</i> UTL 282 <i>students whose last names begin with N - Z</i>	Jorge Sulca Flores <a href="mailto:jsulcaf1@jhu.edu">jsulcaf1@jhu.edu</a> Danny Duckworth <a href="mailto:dduckwo4@jhu.edu">dduckwo4@jhu.edu</a> Sophia (Qixin) Wu <a href="mailto:qw22@jhu.edu">qw22@jhu.edu</a>

## COURSE WEBSITE (Blackboard site)

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The course website is available at <http://blackboard.jhu.edu>. The site is part of the university's Blackboard system of course websites. The course website is an important tool for communication outside of class. Additional directions for lab exercises and most lab assignments will be disseminated via the website. Please check it often!

## JOHNS HOPKINS POLICIES AND SUPPORT SERVICES

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The Johns Hopkins University (JHU) Arts and Sciences / Engineering Catalog and the JHU Undergraduate Academic Manual contain information on a wide variety of topics, such as support services, clubs and student organizations, and policies relating to student rights and responsibilities. This course is governed by the policies set forth in these two documents.

Some JHU student support services you may find useful include...

SUPPORT SERVICE	LOCATION	PHONE NUMBER / WEBSITE
<b>Undergraduate Academic Advising</b> <i>registration advice, declaring a major, etc.</i>	Garland Hall 3 <sup>rd</sup> floor	(410) 516-8216 <a href="http://www.jhu.edu/advising">http://www.jhu.edu/advising</a>
<b>Student Disability Services Office</b> If you are a student with a disability or believe you might have a disability that requires accommodations, please contact the Student Disability Services Office.	Garland Hall room 385	(410) 516-4720 <a href="http://web.jhu.edu/disabilities">http://web.jhu.edu/disabilities</a> studentdisabilityservices@jhu.edu
<b>Counseling Center</b> <i>confidential assistance with personal and vocational concerns</i>	3003 N. Charles St. Suite S-200	(410) 516-8278 <a href="http://www.jhu.edu/~ccenter/">http://www.jhu.edu/~ccenter/</a>
<b>Department of Biology website</b> <i>tips for getting research experience, information on majors and combined bachelors/masters programs</i>	-----	<a href="http://www.bio.jhu.edu">http://www.bio.jhu.edu</a> Click on "Undergraduates"

## A WORD ON ETHICS

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The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

**Please note that “unauthorized collaboration” includes working together outside of class on a lab assignment. Your work must be your own.**

Report any violations you witness to the instructor. You may consult the associate dean of student conduct (or designee) by calling the Office of the Dean of Students at 410-516-8208 or via email at [integrity@jhu.edu](mailto:integrity@jhu.edu). For more information, see the Homewood Student Affairs site on academic ethics: (<https://studentaffairs.jhu.edu/student-life/student-conduct/academic-ethics-undergraduates>) or the e-catalog entry on the undergraduate academic ethics board: (<http://e-catalog.jhu.edu/undergrad-students/student-life-policies/#UAEB>).

## LAB MAKE-UP POLICY

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Acceptable reasons for missing lab include illness, a religious holiday, emergency, or a team sporting event. In any of these cases, you must inform your regular teaching assistant **BEFORE your lab begins that day**, and preferably in advance if possible. If you miss your lab section, you may attend another lab section *that same week* instead. **However, you must inform both your regular teaching assistant and the teaching assistant for the section you wish to attend, in advance.**

It will not be possible to make up labs after the week the particular lab was offered. **However, in the case of illness, we will make special arrangements.** Again, you must inform your teaching assistant before class, as reagents and supplies are normally put away after Friday's lab.

In addition, students missing more than two labs will have to contact the course instructor for permission to make up any successive labs, and will have to document the reason for their absences in writing (doctor's notes, etc.).

## FLOW CHARTS

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Each student must present a flow chart at the beginning of the lab period, outlining that day's lab procedure(s). The chart may be a list of steps or a diagram, but it must be in your own words. Do not copy straight out of the lab directions! Even if students will work as a pair, each student needs to prepare a flow chart.

Any student who does not come to class with a flow chart will not be allowed to begin the lab until the chart is completed. Complete, on-time flow charts will automatically receive a score of 100%. Incomplete or late charts will automatically receive a score of 0%. So, if you are late to class, you will not receive any credit for your flowchart. In addition, students arriving without copies of the lab directions and lab exercise will NOT receive flowchart points.

Students making up a missed lab who do NOT notify the instructor in advance will also lose their flowchart points.

We hope that you will find the flowchart helpful as you complete the lab exercise. So, your teaching assistant will not collect the flowchart during class, but will view it and grade it sometime during the lab.

Your overall flowchart grade will be calculated as follows:

Number of Flowcharts Receiving Grades of 0%	Overall Flowchart Grade
0	100% (A)
1	85% (B)
2	75% (C)
3	65% (D)
4 or more	0% (F)

### PRE-LAB ASSIGNMENTS

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Preceding each lab exercise, there will be an electronic pre-lab assignment due. This assignment will cover material covered in the online lab lecture and in the lab assignment directions. **Pre-lab assignments are due the day of your lab section.** These assignments will be available on the course website. Although Blackboard will call them “tests”, you may in fact open and close each assignment as many times as you like, as long as it is submitted by the due date and time. Also, you may use any of your notes or class materials, but NOT another human being in order to complete the pre-lab assignment. At the end of the semester, your lowest pre-lab grade will be dropped from your final average.

### LAB ASSIGNMENTS

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Following each lab exercise, there will be an assignment due. Some of these will be collected at the end of the lab period, others will be due the following week in lab. Your assignment *must* use your own data collected in lab, no matter how pleased or displeased you are with your results.

Late assignments will only be eligible for a maximum score of 60%. Extensions on assignments may be only be requested *before* the due date.

### GRADING

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Grades will be based on the following assessments:

ASSESSMENTS	PERCENT OF FINAL GRADE
flow charts	10%
pre-lab assignments	15%
lab assignments	75%

Final grades will be based upon the following scale:

PERCENT SCORE	FINAL GRADE	PERCENT SCORE	FINAL GRADE
96 - 100%	A	90 - 95 %	A-
88 - 89%	B+	85 - 87%	B
80 - 84%	B-	78 - 79%	C+
75 - 77%	C	70 - 74%	C-
68 - 69%	D+	60 - 67%	D

## LAB SAFETY RULES

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1. No eating or drinking in the lab. This includes bringing containers of food or drink into the lab, including bottled water. Gum chewing is also forbidden.
2. No music players of any kind are allowed in the lab.
3. Treat all equipment with respect and caution. Much of it is expensive and some of it can be dangerous if used improperly.
4. Read all labels and directions prior to using chemicals, and take proper precautions to ensure everyone's safety. If you are not sure about a chemical or the precautions necessary, ask your teaching assistant (TA).
5. Clean up all spills immediately with tap water. If you spill a caustic chemical on yourself, rinse the affected area immediately with lots of water and tell your TA.
6. Closed shoes must be worn in lab.
7. Safety glasses will be available for you to wear when appropriate.
8. When gloves are used during a particular lab, they may NOT be worn in the hallways.
9. We will produce three types of solid waste in this lab:
  - A. **BIOHAZARDOUS WASTE:** Any biological waste (bacterial plates, etc.) should be put into the red biohazardous waste bag. The university treats any lab waste as biohazardous, so if you are not sure where to put something, put it into the red bag.
  - B. **GLASS WASTE:** Broken glass and disposable Pasteur pipets should be put into the Glass Waste container. When this container is full, the TA will seal it and put it into the red biohazardous waste box.
  - C. **"SHARPS" WASTE:** Used razor blades and needles should be put into the special box marked "sharps". When this container is full, the TA will seal it and put it into the red biohazardous waste box.
10. Liquid waste that is caustic or toxic must be poured into the properly labeled waste disposal jug. These jugs are kept in and under the fume hoods.
11. Students are responsible for cleaning up after themselves at the end of each lab. Points may be deducted from the student's lab assignment if proper clean-up is neglected. Clean-up includes the following:

- A. Work areas should be wiped down with a wet paper towel. If bacteria were used in that day's lab, either disinfectant, bleach or 70% ethanol should be used instead.
  - C. All equipment must be turned off.
  - D. All unused reagents must be capped and stored as instructed.
  - E. Any completely *empty* boxes of pipet tips should be exchanged for *full* boxes. (Be sure you know the storage areas for both kinds of pipet tip boxes in your lab.)
  - F. Pipet waste containers that are full must be emptied into the biohazardous waste and returned to their usual locations.
  - G. Wash your hands before you leave the lab.
12. Be aware of the locations of the fire extinguisher, safety shower, emergency eye wash and first aid kit.
13. Students disobeying the above rules or generally acting irresponsibly may be expelled from the course.

*The information in this syllabus is subject to change.*



LABORATORY SCHEDULE

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<b>WEEK</b>	<b>EXERCISE(S)</b>
1/28-2/1	<i>UNIT A: DIVERSITY OF LIFE</i> <ul style="list-style-type: none"><li>• <u>Comparative Anatomy, Part I</u>: Dissection</li></ul>
2/4-2/8	<i>UNIT A: DIVERSITY OF LIFE</i> <ul style="list-style-type: none"><li>• <u>Comparative Anatomy, Part II</u>: Poster Presentation</li></ul>
2/11-2/15	<b>FIELD TRIP ON YOUR OWN</b> <i>UNIT A: DIVERSITY OF LIFE</i> <ul style="list-style-type: none"><li>• <u>Diversity of Life</u>: Field Trip to the National Aquarium in Baltimore</li></ul>
2/18-2/22	<i>UNIT A: DIVERSITY OF LIFE</i> <ul style="list-style-type: none"><li>• <u>Protostome from the Garden: Experiments with Live Pillbugs</u></li></ul>
2/25-3/1	<i>BRING FOOD SAMPLES IN FOR TESTING</i>  <i>UNIT B: PLANT BIOTECHNOLOGY</i> <u>PCR Detection of Genetically Modified Foods</u> : DNA Extraction, Part I
3/4-3/8	<i>UNIT B: PLANT BIOTECHNOLOGY</i> <ul style="list-style-type: none"><li>• <u>PCR Detection of Genetically Modified Foods</u>: DNA Extraction, Part II and PCR</li></ul>
3/11-3/15	<i>UNIT B: PLANT BIOTECHNOLOGY</i> <u>PCR Detection of Genetically Modified Foods</u> : Electrophoresis
3/18-3/22	<b><i>NO LAB— SPRING BREAK</i></b>

3/25-3/29	<i>UNIT C: HUMAN ANATOMY AND PHYSIOLOGY</i> <ul style="list-style-type: none"><li>• <u>The Language of Anatomy</u></li><li>• <u>Organ Systems Overview</u></li><li>• <u>The Skin</u></li></ul>
4/1-4/5	<i>UNIT C: HUMAN ANATOMY AND PHYSIOLOGY</i> <ul style="list-style-type: none"><li>• <u>Anatomy of the Heart</u></li><li>• <u>Human Cardiovascular Physiology</u></li><li>• <u>Blood</u></li></ul>
4/8-4/12	<i>UNIT C: HUMAN ANATOMY AND PHYSIOLOGY</i> <ul style="list-style-type: none"><li>• <u>Overview of the Skeleton</u></li><li>• <u>The Axial Skeleton</u></li><li>• <u>Human Reflex Physiology</u></li><li>• <u>Joints and Body Movements</u></li></ul>
4/15-4/19	<i>UNIT C: HUMAN ANATOMY AND PHYSIOLOGY</i> <ul style="list-style-type: none"><li>• <u>Gross Anatomy of the Muscular System</u></li><li>• <u>Gross Anatomy of the Brain and Cranial Nerves</u></li></ul>
4/22-4/26	<b>WEB-BASED LAB ON YOUR OWN</b> <i>UNIT C: HUMAN ANATOMY AND PHYSIOLOGY</i> <ul style="list-style-type: none"><li>• <u>Human Immunology</u></li></ul>
4/29-5/3	<i>UNIT C: HUMAN ANATOMY AND PHYSIOLOGY</i> <ul style="list-style-type: none"><li>• <u>Functional Analysis of the Urinary System</u></li><li>• <u>Functional Anatomy of the Digestive System</u></li><li>• <u>The Special Senses</u></li></ul>