

## Biology 4120 – Comparative Physiology, Spring/Summer 2019

The objectives of the course are to expand your knowledge of the principles of physiology to describe the unity and diversity of life. To meet this objective you will read the textbook, study articles from the primary literature and discuss them in class, design experiments, work through problem sets and other activities, discuss physiology, perform labs and write an independent literature research project. Your success at meeting the objectives will be evaluated by exams, homework, in-class activities, assignments, discussions and lab work. The three topics of the semester will be neurophysiology, exercise physiology and reproductive physiology.

### Content Learning Objectives

Students will be able to:

1. describe how an organism's physiology contributes to its fitness in its environment and relates to its place on the **evolutionary** tree of life.
2. describe how biological **structures affect function**, from the molecular to the organ-system level.
3. describe how physiological control systems sense and process **information** to regulate physiology.
4. describe how physiological solutions optimize **energy** use, or not.
5. describe how **complex systems** are essential for physiology.

### Skill Learning Objectives

Students will be able to:

1. **clearly describe principles of physiology** with examples from many types of organisms.
2. **interpret data** from the primary physiology literature, including describing the hypothesis, approach, results and conclusions of a set of experiments.
3. **evaluate physiology experiments** from the primary literature, including identifying control experiments, and whether the results support the authors' conclusions.
4. **design a physiological experiment**, and describe the hypothesis, approach to test the hypothesis and the results that would support or refute the hypothesis
5. **contribute in a team**, and describe team experiences in a personal statement or interview.

**Writing Intensive:** This course meets the writing intensive requirement for biology majors. The writing component is an integral part of the course for all students, including non-biology majors, students who already have a degree and biology majors who have already met their writing intensive requirement. You cannot take this course without the writing intensive component.

**Prerequisites:** Completing Bio 3070 and 3200 with grades of C-minus or above are prerequisites for this course. We will especially build upon the knowledge and skills in Bio 3200. In addition, because this is the advanced writing intensive for majors, it is strongly recommend that you successfully complete your elementary and intermediate writing requirements before taking this course, and think about how you can apply what you have learned in those classes to the work you do in this course. As described in the objectives, the writing intensive focuses on learning to read and synthesize the primary and review literature in physiology. This course does not focus on basic or intermediate writing skills, but these skills are required to successfully complete this course. If you have trouble with sentence and paragraph structure or other writing skills, contact the University writing center at (313) 577-2544 or go to <http://www.clas.wayne.edu/writing/>. As your TAs and I grade lab reports, term papers, exams and other assignments, we will take clear, correct writing in standard English into account.

**Instructor:** Sherika Gibson

**E-mail:** [ai6389@wayne.edu](mailto:ai6389@wayne.edu)

**Course website:** [www.Canvas.wayne.edu](http://www.Canvas.wayne.edu)

Sherika Gibson's **office hours** are by appointment to be arranged by e-mail at least 24 hours in advance.

**Lectures** meet from 4:30 to 6:00 pm on Tuesdays and Thursdays in Room 425 State Hall

**Lab sections** meet in 309 Shapero Hall (and room 316 when announced):

CRN 31562    Thursdays 1:00 pm - 4:00 pm    Asia Hightower [ev4173@wayne.edu](mailto:ev4173@wayne.edu)

CRN 31563    Thursdays 6:30 pm - 9:30 pm    Despina Tsilakidou [despo@wayne.edu](mailto:despo@wayne.edu)

### **Required**

Principles of Animal Physiology,  
Third Edition  
by Christopher Moyes and Patricia Schulte  
ISBN: 0321501551

### **Recommended**

Reading The Primary Literature: A Practical  
Guide to Evaluating Research Articles in Biology  
by Christopher M. Gillen  
ISBN: 0-8053-4599-X

**Participation:**        There will be participation points available during lecture session. Most points will be earned by doing other work during class or out of class. The maximum number of participation points that will count towards your final grade is 50 points. There will be opportunities to earn at least 60 points, so if you miss a day or two of points for personal reasons, you can still earn a perfect participation score. This system is **instead of** make-up opportunities for individual missed points.

**Exams:**                There will be 4 closed-book exams during regular class hours. Each will include material covered since the last exam. Exams will be multiple choice, true or false, fill in the blank, and essay questions. The format may vary from exam to exam. The lowest grade of the first 3 (Exam 1, 2 or 3) closed-book exams *will be dropped, however, Exam 4 is mandatory and cannot be dropped. There will be no make-up exams.*

**Final Lab Report:**    You will complete one literature research paper. Small assignments that will build to the final term paper include the selection of a topic and articles, the transitions between the articles, the summary of one of your selected articles, a rough draft, and a peer review session. These assignments will help you make continuous progress through the semester. They are worth 10 points each and, except completing the peer review, are due at the beginning of your lab session. The final draft is worth 70 points.

**Lab reports:**         You will write two unit lab reports. The lab reports may include brief background information, the methods, the results, your conclusions and a complete list of articles cited, as described in the assignments to be posted on Unicheck. In order for your assignment to be considered on time. It must be handed in on time during lab and posted on Unicheck. Lab reports are due at

the beginning of your lab session as indicated in the schedule. It will be considered late if you are one minute late to lab.

The beginning of the lab session is defined as the time that your lab session is scheduled to start. Assignments turned in or uploaded on Unicheck after the beginning of your lab session but during the same day, will be downgraded 10% of the possible points.

Assignments not turned in during lab should be taken to the Biology office. Ask the front desk personnel to *time stamp* your assignment and put it in your TA's mailbox. You are responsible for assignments turned in to the office. If they lose your assignment, we will assume you did not turn it in. **You may not turn in or earn credit for a lab report for a lab you did not attend and fully participate in. If an assignment is turned in more than 4 days late, no credit will be given!**

**If you need to miss a lab, you will write a summary of an article as a replacement for the lab.**

### Student-designed

#### Labs:

At about the mid-way point in the semester, you will design your own lab to research a significant topic in physiology. You will have access to laboratory organisms, equipment, and chemicals to research this topic. Students will work in teams and have at least 2 weeks to plan the labs. You will present your research findings to your lab section in groups. Every student must turn in a final typed report based on the research findings on July 18th. TAs will discuss specific project requirements and content in lab sections.

Details of homework, participation, term paper and other lab assignments will be announced or distributed in class or posted to Canvas through the semester. The beginning of the lab session is defined as the time that your lab session is scheduled to start. Assignments turned in after the beginning of your lab session, but during the same day, will be downgraded 10% of the possible points. Assignments not turned in during lab must be taken to the Biology office. Ask the front desk personnel to time stamp your assignment and put it in your TA's mailbox. You are responsible for assignments turned in to the office. If they lose your assignment, we will assume you did not turn it in. **You may not turn in or earn credit for a lab report section for a lab you did not attend and fully participate in.**

#### Grades:

	Points for exams.
Exam 1	200
Exam 2	200
Exam 3	200
Exam 4	200
In class Participation	50
<u>Drop lowest of Exam 1-3</u>	<u>-200</u>
Total	650

**Points for lab activities:**

2 Unit Lab reports	60
Outline of planned lab	10
Plagiarism	10
Student-designed lab presentations/report	50
Term Paper	120
Total	250

**\*\*Term Paper grade is comprised of the Topic & Articles (10 pts) Term Paper Transitions (10 pts), Article Summaries (10 pts), Term Paper Draft (10 pts), Peer Review (10 pts), and Term Paper Final Draft (70 pts).**

**Grading Policy:** Grades will be calculated on the following scale: (out of 900 points)

	A 92.5-100%	A- 90.0-92.4%
B+ 87.5-89.9%	B 82.5-87.4%	B- 80.0-82.4%
C+ 77.5-79.9%	C 72.5-77.9%	C- 70.0-72.4%
D+ 67.5-69.9%	D 62.5-67.4%	D- 60.0-62.4%
	F 0-59.9%	

I do not curve the grades. Everyone can earn an A, if they perform well.

**Note about Lecture Schedule:** The lecture schedule is tentative and may be changed at any time by the instructor. Exams will be held on the days indicated in the syllabus and will not be changed unless a University issue demands it. You may use these dates to plan your schedules as the instructor will not change them. *If lectures fall behind, you will only be tested on the topics covered in classes, labs, and assignments.*

Some of the topics in lecture may not be in your book. You will still be responsible for this material. I am happy to help students during office hours. However, office hours are not a substitute for attending lectures. The lab schedule is posted separately on Canvas.

**General Policies:**

**1) Anyone caught cheating or plagiarizing will automatically receive a failing grade for the exam, assignment or class, and may be expelled from the University.**

Your written work will be submitted to Unicheck (or similar software) for an evaluation of your ideas and proper use and attribution of sources. As part of this process, you may be required to submit electronic as well as hard copies of your written work, or be given other instructions to follow. By taking this course, you agree that all assignments may undergo this review process and that the assignment may be included as a source document in Unicheck's restricted access database, for the purpose of detecting plagiarism in such documents. Any assignment not submitted according to the procedures given by the instructor may be penalized or may not be accepted at all.

Because our goal is to help you learn how to not plagiarize, information on how to avoid plagiarism will be provided in class, on Canvas, and by your TAs. If you do not understand how to avoid plagiarism, please ask for help from your TA or from Professor Gibson in office hours. **For discussions of cheating and plagiarism see the class Canvas site, and the "Student Code of Conduct," which is available at <http://doso.wayne.edu/assets/codeofconduct.pdf>**

2) **Email guidelines:** I will not reply to emails when the answer can be found in the syllabus or on Canvas. You must email me from your WSU account for privacy reasons. I will respond to most emails within two business days. After two business days, you may email me again. I expect emails to be in a professional style, with your course number and information about what the issue is in the subject, e.g. **“BIO 4120: Question on Kidney Lecture”**, a proper greeting, e.g. “Dear Professor Gibson,” a proper salutation, e.g. “Sincerely, Chris Smith,” correct punctuation including capitalization and no texting abbreviations. Emails that do not follow these rules may take longer get a reply, may be returned for correction, or ignored. If I cannot figure out what you want, I cannot help you. Following these guidelines will improve your success at WSU and beyond.

I do not answer questions by email if they require a discussion. This includes questions on content and study or writing strategies. Please come talk to me during office hours to discuss these issues. This may require planning ahead so that you can get your answers before assignment deadlines or exams.

3) Any special considerations (disabilities, religious holiday conflicts, etc.) must be brought to the attention of the instructor by May 22, 2018 or as soon as possible as the situation arises. If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TTY: telecommunication device for the deaf; phone for hearing impaired students only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Please refer to the SDS website for further information about students with disabilities and the services we provide for faculty and students:

<http://studentdisability.wayne.edu/>

4) Problems and challenges regarding the grading of any assignment must be brought to the relevant teaching assistant’s attention in a typed, concise and coherent memo within one week of the date the assignment is returned to the lab section. Once you talk to the TA about the work you are no longer eligible for a regrade.

For challenges to exam questions, an Exam Question Challenge Form, which will be available on Canvas, should be sent to Professor Gibson in an email. For challenges to multiple-choice questions, you need to convince me that your answer was the best answer, given reasonable assumptions that you explain. For short answers, you need to convince me there was an error in the grading, not simply that you want more points. I will regrade short answer or essay questions from my scanned copy of the graded exam. Once you talk to me about the work, you are no longer eligible for a regrade. **When I regrade any work I may regrade the whole assignment in addition to the section you are protesting, and your grade may drop.**

5) No assignment may be turned in to your teaching assistant by email or FAX. If you do not turn an assignment in during lab, then you may turn it in to your teaching assistant’s mailbox in the Biology main office when it is open. You are responsible for requesting that the office staff time stamps your work. Know your teaching assistant’s first and last name for correct delivery. The office staff does

not know the teaching assignments of the graduate students. You will lose 10% of the possible points for each day an assignment is late, even if you have a valid excuse. An assignment is not considered turned in until both the digital and hard copies are submitted. A day late is from one minute after the assignment is due to 24 hours late. You will lose another 10% of the possible points for each subsequent day an assignment is late. A day is a business day on which the University is open (including days during spring break). You may turn in assignments to your teaching assistant's mailbox early without penalty, but we anticipate that this will not happen often because we expect 100% attendance in lab (and lecture).

6) **Professional behavior** is expected in lecture & lab, which includes respecting your classmates by

- arriving prepared and on time
- actively contributing to your group or the whole class
- not interrupting or talking when others are talking
- turning off cell phones and
- not eating or drinking during class

All students must show respect in language and attitude towards the instructor and their fellow students. Disrespectful students will be asked to leave the lecture or lab, and will lose their opportunity to turn in any missed assignments. No unregistered students may attend lab or lecture, especially children.

7) **Withdrawals:** May 19, 2019 is the last day you can drop the class and get your tuition refunded. The last day you can drop this course and have no record on your transcript is June 2, 2019. The last day to drop this course is July 14, 2019. If you withdraw between June 3 and July 14, 2019, inclusive, you will receive a WN on your transcript if you never completed any assignment; a WP if you have greater than 60% of the points possible at the time of your request on exams, homework, quizzes and class participation; or a WF if you have less than 60% of the points possible at the time of your request. No exams or other grades are dropped in this calculation. Lab grades are not included in this calculation. You initiate a withdrawal request in Pipeline by selecting "Withdraw from a Class" on the Student Self Service Menu.

8) For any and all issues not covered in this syllabus, refer to the "Student Code of Conduct", which can be found at <http://doso.wayne.edu/assets/codeofconduct.pdf>

9) University closures will be publicized through:

- the University Newslines (313) 577-5345\*,
- WSU Homepage ([www.wayne.edu](http://www.wayne.edu))\*,
- WSU Pipeline ([www.pipeline.wayne.edu](http://www.pipeline.wayne.edu))\*,
- WDET-FM (Public Radio 101.9) and
- by other local radio and television stations.

\* Note: The information on closures and class cancellations is likely to be found at these locations before it is broadcast by local radio and television stations.

If an hourly exam is scheduled on a day when the University or lecture room is officially closed during class, the exam will be held during the next scheduled meeting of lecture that occurs when the University and room are open, or as indicated on the class Canvas site.

If the University or lab room is officially closed during your lab, any assignment that was due that day is then due at the next scheduled meeting of **lecture or your lab** that occurs when the University or lab are open, whichever comes first, or as indicated on your lab Canvas site.

10) Updates and corrections to this syllabus will be described in class and/or posted on the course Canvas site. You are responsible for checking Canvas announcements and your University email account. I recommend checking at least once each business day of a semester in which you are enrolled.

### **Tentative Lecture Schedule**

<b>Date</b>	<b>Topic</b>
7-May	Introduction
9- May	Membranes/Research
14- May	Properties of Membranes
16- May	Cell Signaling
21- May	Nervous Systems I
23- May	Nervous Systems II/Unit Wrap Up
28-May	Cardiovascular Systems I
<b>30-May</b>	<b>Exam I</b>
4-June	Cardiovascular Systems II
6- June	Respiration I
11- June	Respiration II
13- June	Muscles and Locomotion I
18- June	Muscles and Locomotion II/Unit Wrap Up
<b>20- June</b>	<b>Exam II</b>
25- June	Renal Physiology I
27- June	Renal Physiology II
2-July	Digestion I
<b>4-July</b>	<b>No Class</b>
5- July	Digestion II
9- July	Reproduction I/Unit Wrap Up
<b>11- July</b>	<b>Exam II</b>
16- July	Reproduction II
18- July	Endocrine Systems I
<b>23- July</b>	<b>Study Day</b>
<b>25- July</b>	<b>Exam 4-Last Day of Class</b>

**Labs:** The labs will meet in 309 Shapero Hall unless indicated by your TA. The tentative schedule is below:

Dates	Topic	Assignment Due	Points
May 9	Lab 1: Perception/ Brains		
May 16	Lab 2: Receptive Fields	Plagiarism Essay	10
May 23	Lab 3: Cockroach Neurophysiology	Topic & Articles	10
May 30	Lab 4: Earthworm EKG	Term Paper Transitions Neurophysiology Lab Report	10 30
June 6	Lab 5: Daphnia	Article Summaries	10
June 13	Lab 6: Human EKG		
June 20	Planning student design labs	Cardio Lab Report	30
June 27	Discuss planned labs with TA	Outline of Planned Lab Term Paper Draft Peer Reviews	10 10 10
<b>July 4</b>	<b>No Labs-Independence Day</b>		
July 5	Student-designed labs		
July 11	Student-designed labs		
July 18	Lab Presentations Designed Lab Reports	Lab Presentations Designed Lab Reports	10 40
July 25	Term Paper	In Lecture	70