

# Biol 150: Anatomy & Physiology I

Fall 2023 (2310)

Lecture: MWF 11:10AM – 12:00 PM

Lab: W 1:10-4:00PM

Park 127

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he / him/ his

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Office hours: TBD



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## Welcome to Anatomy and Physiology I!

Have you ever wondered what your muscles look like? Or why it hurts so badly when you bang your little toe? Or what the different parts of the brain actually do? If so, then this class is for you! We're covering from chemistry to the nervous system and starting with the endocrine system in the spring. We will not be just memorizing the names of the parts of the human body, rather we will be applying basic anatomical and physiological principles to relate structure and function, identify structures on dissections and anatomical models, and solve clinical case studies. Additionally, I will encourage us to take anti-racist, feminist, and fat liberationist lenses to the material and our relationships to it. Whether you are on track to go to medical school, nursing school, graduate school, or something completely different, having a knowledge of human anatomy and physiology and how the body works is essential towards being a scientifically and medically literate citizen and will undoubtedly help you during your own personal lives.

### Course Goals

Below are a few goals to focus on as we progress throughout the course. These are the big ideas that you should walk away with and hold on to by the time class is over. Specifically, at the end of this course, you should be able to:

- Use appropriate terminology to effectively discuss human anatomy
- Recognize recurring themes in physiological processes
- Identify anatomical structures in the major organ systems of the human body and explain how form and function are related
- Recognize and explain the interrelationships within and between the systems of the human body
- Predict physiological consequences using anatomical principles, and vice versa
- Evaluate case studies by applying anatomical and physiological principles
- Integrate across levels of organization to understand how mechanisms and whole body outcomes are linked
- Use dissections, models, and computer resources to identify and describe anatomical structures

### Course Materials

Books: Principles of Anatomy and Physiology, by Tortora and Derrickson

(I'm following the 15<sup>th</sup> edition, but 11<sup>th</sup> and 16<sup>th</sup> editions should be really similar). The bookstore stocks the 11<sup>th</sup> edition

- If you find another anatomy and physiology text you like / that's a good deal, that will also likely serve you well! Marieb and Hoehn are great.
- I'd recommend choosing a text that was published in the past 15 years.
- If you know you rarely read textbooks, I can direct you to an open-source backup that's functional but not the easiest to follow.

Visible Body: This is an online and mobile anatomy atlas, A&P digital / interactive text, and courseware. It costs \$49.99 and you have access for a year, but you can use it free for the first 2 weeks. Please let me know if this is a hardship for you so I can work out a solution. I've made

this required because I am assigning weekly assessments that I intend to supplement your lab activities. The following is our course link:

[https://courseware.visiblebody.com/courses/101254/join?join\\_course\\_token=Z3VM3ZK4McARH2uA16PCabJs&site\\_license=false](https://courseware.visiblebody.com/courses/101254/join?join_course_token=Z3VM3ZK4McARH2uA16PCabJs&site_license=false) .

When you sign up via this link, you will be able to see the materials I curate for you to go with what we're covering as well as the assignments you have due. You will also have access the apps, the Human Anatomy Atlas being the main reason I like this software. Our course does not have access to a human cadaver, but instead will be using a combination of plastic models, animal specimens, and 2-D pictures. The addition of Visible Body will tie these pieces together, ideally allowing you to think in three dimensions about human bodies, while getting experience with actual tissues in lab.

### **Course Structure and Components**

Lecture and Lab Components: In the lecture component of this class, I will present in traditional lecture style, but this will be punctuated with practice activities, discussions, and hopefully, opportunities for you to share expertise from knowledge and experiences gained outside of class. In lecture, we will focus on understanding principles of how the structure and function of bodies interact, as well as physiological processes at multiple levels of organization.

In the lab we will focus on a thorough study of the structures of the human body by combining a hands-on approach through the inspection and investigation of plastic models of the human body and preserved animal material, dissection of animal tissues, and with the analysis of a virtual cadaver (the Visible Body apps). We will also use in-vitro demonstrations of physiological processes and concepts, as well as experiments and measurements you conduct on your own and classmates' bodies (*with consent: no one is required to supply their own body for the sake of class activities and will not be penalized for declining to be a subject*). Through the lecture and lab components, you will not only learn the essentials of human anatomy and physiology, but you will learn how they are essential towards evaluating real-life situations and having agency in the context of your own body.

Material covered: I intend to be transparent about what material you I expect you to know when being assessed in this course. After each lecture, I will post a list of terms and concepts that you will be responsible for, as well as learning goals, corresponding to what we covered that day. The same will be included on your lab guides. You will not have to remember information that is not a part of those lists. I will not test you on information that you would have to acquire outside of class time (e.g. no required reading) excepting that which we agree upon as a class, and materials from Visible Body that will also be listed in your lab materials.

Much of anatomy and physiology are cumulative, meaning that if you are struggling with a topic early on, you may continue to have difficulties. (Or not. Often putting more foundational concepts into context makes them make sense.) I am most interested in you learning anatomy and physiology, not necessarily learning them at a certain speed. I'll do my best to observe your progress and give feedback and assistance, but I will appreciate your self-awareness and open communication to ask for what you need from me and the class.

Assignments: Anatomy and physiology are broad and dense topics that for many people require considerable study time to integrate. Because of this, ~40% of your grade in the course will come from engaging in activities that will contribute to that studying. Or more plainly, participate, turn something in, try and you will get the points.

- Getting started: when semester begins, I'll ask you to fill out an **Introductory Questionnaire** about yourself, your learning, your goals. It will really help you, me, and the class for you to do it, so it'll be worth some points. Visible Body has a getting started

guide to learn the features of the software and there's a quiz to complete. The **Visible Body Getting Started quiz** is to give you structure in becoming familiar with the courseware.

- **Ruminations:** There are a lot of reasons to learn anatomy and physiology you are already an expert in at least one of them: you have a body! Your submission will be a short reflection, critical question, sharing of expertise, etc. relating to the day's material. My goals for this practice is to give you structure to engage with the material outside of its course context, to encourage you to tie together concepts that we might not plan to address, and to identify your expertise.

There will be 17 submissions, one due for each general topic we're covering. Each is worth 3 points for a total of 51 points throughout the term. I expect these to show that you have thought about and engaged with the topic. If it is clear you have not or your rumination does not tie into the day's topic, I reserve the right to give less than full credit or ask you to redo the rumination. (Please don't stress about this—I've graded >6000 of these and this may have come up 5 times total.)

- **In-class assessments:** These are quizzes, but will be graded based on doing them, not on getting correct answers. I'll post them each week on Friday evening, to be due by class Monday, where we'll discuss the answers at the beginning of class. There will be 5-10 questions that you should complete, closed-book, no notes. While a few questions may be similar to what you encounter on midterms, the assessments will not necessarily be representative of what to expect. I'll ask you to score them and we can discuss the answers. I'll use these to assess MY performance, as well as to give you a sense of what you've integrated and where you may need to focus your studying / ask questions. We both get the data, you get 4 points. I'll come around and discuss yours with you during lab each week.
- **Visible Body assessments:** These are actual graded quizzes worth 10 points each that you'll find on the Visible Body site. You'll have one that corresponds with every lab and will be due a week later. The focus will be on visual information, specifically that which you are responsible for within Visible Body's tools. I would like you to take it individually and without notes. You can take the assessment as many times as you want and your highest score will be your grade. You will not receive a lower score if you score lower on subsequent attempts, so feel free to use this as a study tool. The questions will usually come from a question bank, so each time you take it, the quiz will likely be different than the last attempt.
- **Lab contribution:** Labs will be in different formats until we start focusing on dissections at the end of the semester. You will be graded on different criteria depending on the lab (e.g. completing a worksheet, producing a figure, presenting a finding) and may just be based on my observation that you are actively participating and contributing. You will earn up to 10 points for your efforts in lab each week. If you will miss a lab, let's discuss makeup options ASAP.

During labs in which we will be working with tissues and/or sharp tools, make sure to wear clothing that covers your legs and ankles, as well as closed topped, closed toed shoes.

- **Post-lab:** These will be short assignments ranging from completing an activity you started in lab, creating a study guide or conceptual figure, answering questions, or

writing a meta-summary of what you took away from the exercise. These will be due a week later for 3 points each.

- **Lab practicals:** There will be two lab practical exams, one in the middle of the term and the other on the last day of class. These exams will assess your in-depth knowledge of anatomical structures and, to a lesser degree, physiological processes by having you rotate through stations to identify structures that have been tagged on the class's dissections, models, images, or from the Visible Body atlas. The second practical will not explicitly cover material from the first period, but as anatomy and physiology build upon foundations of concepts so there will be some conceptual overlap. After the practical, you will be responsible for the initial grading of your exam.
- **Exams:** There will be **two midterms** and one **final exam**. Each will be take-home and assigned a week before it is due. They will be closed-book, closed-note, and not subject to time-limits, although you will be expected to complete the exam in a single sitting. The exam questions will assess your in-depth knowledge and mastery of the course material using a variety of question formats. The midterms are worth 100 points each. The exams are cumulative, but the focus will be on the new material. I will provide a study guide consisting of the terms and learning objectives that will be on the exam, with the goal of posting it a week before the exam is posted.
- **Midterm self-grading:** You will receive up to 5 points for completing the initial grading of your midterm exam. After all exams are submitted, I will post the exam key and you will assess if your answers are correct and assign preliminary points. In addition to reviewing the material and making you think about whether an answer is correct, this is an opportunity for you to communicate that you thought about a question differently than I did and to explain your thought process. Once you submit your self-grading and preliminary score, I will check that I agree and add in partial credit.
- **Ethics project:** You will produce a well-researched short paper or presentation on ethical considerations of a topic of interest to you relating to anatomy and/or physiology. You will receive 2 points for submitting your proposed topic to me by November 1<sup>st</sup>. Your final product will be worth 48 points and we will discuss further logistics in class.

Learning Objectives: I value being clear and transparent. In order for you to do well in this course, you will need to know exactly what I want you to be able to, and this is where learning objectives come in. After each lecture, I will post the learning objectives that clearly state what I expect you to be able to do based on what we covered that day. (Let me know if it isn't clear!). For example, "At the end of this class session, you will be able to identify and explain the functions and characteristics of the types of vertebrae." Learning objectives are things that you can actually DO, so you will be able to tell whether or not you really know the material. Learning objectives come in all levels, from the very basic to the very complex, and you will be challenged at all levels in this course.

***Tip:** Make sure that you can actually DO each learning objective – these are the keys to doing well in the course!*

## **Grading Breakdown**

Introductory questionnaire	0.3%	3 point	
Visible Body Getting Started quiz	0.2%	2 point	
Ruminations	5.1%	51 points	(17 at 3 pts each)
In-class assessments	4.8%	48 points	(12 at 4 pts each)
Visible Body assessments	12.0%	120 points	(12 at 10 pts each)
Lab contribution	12.0%	120 points	(12 at 10 pts each)
Post-lab	3.6%	36 points	(12 at 3 pts each)
Lab practicals	16.0%	160 points	(2 at 80 pts each)
Midterms	20.0%	200 points	(2 at 100 pts each)
Self-grading	1.0%	10 points	(2 at 5 pts each)
Ethics project	5.0%	50 points	
Final exam	20.0%	200 points	
<b>Total</b>	<b>100.0%</b>	<b>1000 points</b>	

Based on the above point structure, you can calculate your grade at any time during the semester (ask for help if you need it), and you should calculate your grade regularly to keep track of how you are doing in the course. The number of points will be converted to grades based on the following scale. NOTE: The grading scale is subject to change at the discretion of the instructor and will not be considered final until all assignments have been completed.

4.0	925 – 1000 points	2.7	795 – 824 points	1.3	655 – 694 points
3.7	895 – 924 points	2.3	755 – 794 points	1.0	600 – 654 points
3.3	855 – 894 points	2.0	725 – 754 points	0	Less than 599 points
3.0	825 – 854 points	1.7	695 – 724 points		

## **Course Policies**

Courtesy to Fellow Students: I'd like to have a positive learning environment in this class where we have the space to succeed, fail, be vulnerable, and be genuine. If something is distracting or detrimental to your learning, let's shift course policies to make the environment work for you. Courtesy to your fellow students and to me is imperative—with a caveat. Because we are talking about human experiences and bodies, I'd like to acknowledge that experiences and identities that have been marginalized by dominant power structures can be further harmed by insisting on civility when experiencing or pushing back against harm being done. However, I am committed to assuming best intentions and treating this as a learning space—please do the same with me and with each other and keep communication open.

If any of my actions are harmful to you or a community you're knowledgeable about, I would like to know. I intend to respond with gratitude and take action to fix the problem. If this constitutes you doing substantial labor in relation to marginalized status (e.g. gendered, racial, disability), let's discuss how I can appropriately recognize that labor.

**Tip:** Come see Dr. Wehrle ASAP if you need help with any aspect of the course. If you wait too long he might not be able to help you!

Attendance and Recording: While attending lecture will enrich both yours and the rest of the class's experience of the material, I want you to do what is best for your health and learning. I intend to record each lecture and make it available. Do note that this means that you may be recorded while in class. I will make sure to get your permission explicitly in writing, but until then, this serves as your notice. I will not be recording lab sessions. If you miss a lab, please contact

me ASAP to work out to make it up. If you know you will miss a lab, please let me know as soon as you know (and again a week in advance, if possible).

If you are not feeling well and either need to take care of yourself or may be contagious to others, please do not come to class. While we will be taking precautions to mitigate spread of infectious disease, avoiding exposure is ideal. As an easter egg to that you've read this, please send me your favorite anatomy or physiology meme by 9/11 for an extra credit point. If your ailment is not contagious, please act in the way that is best for your overall wellbeing. In either case, please contact me so we can work out makeup/ alternate options.

Late Work: I will try to share my pedagogical rationale behind the work I assign, including why it's due when it is. I recommend turning work in on time. That said, I am more interested in you learning anatomy and physiology than doing so at a particular speed. If you will be turning in your work outside of the expected timeframe, please keep me updated so I can appropriately budget my time to respond to it. I reserve the right to subtract points for late work, but I very much do not want to use point subtraction as a punitive tool. I would rather your grade be a reflection of your mastery of the material. I will not be able to accept work after the last day of class without us both jumping through administrative hoops.

Getting Help Outside of Class: I will have one scheduled office hour per week, subject to scheduling with the class, and I am open to (but not required to accept) appointments at other times. You may come ask questions, listen, or chat about course, professional, or college relevant topics. If scheduling permits, I can open the lab during my office hour for you to have open study time with the lab materials. If possible, don't ask content questions via email but instead post on the Moodle Discussions board where you can benefit from your classmates' input, clarify their questions, or alert me that a concept was tricky for most of the class.

Policy on Health and Accommodations: As an institution, Bryn Mawr College is committed to providing equal access to students with a documented disability. College policy state that students needing academic accommodations for a disability must first register with Access Services. Students can call 610-526-7516 to make an appointment with the Director of Access Services, Deb Alder, or email her at [dalder@brynmawr.edu](mailto:dalder@brynmawr.edu) to begin this confidential process. Once registered, students should schedule an appointment with me as early in the semester as possible to share the verification form and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement. More information can be obtained at the Access Services website. (<http://www.brynmawr.edu/access-services/>).  
Haverford Students: Haverford College is committed to providing equal access to students with a disability. If you have (or think you have) a learning difference or disability – including mental health, medical, or physical impairment – please contact the Office of Access and Disability Services (ADS) at [hc-ads@haverford.edu](mailto:hc-ads@haverford.edu). The Director will confidentially discuss the process to establish reasonable accommodations. Students who have already been approved to receive academic accommodations and want to use their accommodations in this course should share their verification letter and make arrangements to meet with me as soon as possible to discuss their accommodations. Please note that accommodations are not retroactive and require advance notice to implement.

At any point, if you suspect you would benefit from accommodations but are not yet registered, I am happy to talk to you about the process and your options. If you notice that something in class could be more accessible (whether it directly affects you or not), I'd like to know!

**If you are sick and contagious, I ask that you not attend class (to protect your classmates from your microbes) and contact me for potential arrangements as soon as**

**possible.** To accommodate my health needs, I ask for you not to wear strongly scented colognes, perfumes, lotions, etc. to lecture, lab, or my office hours.

Masking Policy and Ventilation: Masks are required in all indoor class spaces (lecture/lab, my office) and encouraged in other indoor areas. Please wear a well fitted N95, equivalent (e.g. KN95, KF94), or better (e.g. P100, R100) rated mask that covers your nose and mouth with no gaps. If you are not wearing an appropriately rated mask when you arrive at class, I will provide you with one.

If your mask has slipped or is not fitting well, expect that I will bring it to your attention. **If you need to remove your mask** (e.g. to drink water, eat, readjust), **you must exit the classroom** until you put your mask back on. We'll make sure that doesn't cause anyone to miss any course material!

If you wear a respirator with an exhaust valve, please filter your outgoing air. I am happy to help with solutions for that.

Although I do not currently have outdoor meetings planned, I'd like to discuss an outdoor masking policy as a class in order to account for all of our individual risk analyses.

We will have one or more HEPA air purifier running in our classroom during class time. Additionally, the Park Sciences Building does have excellent ventilation.

Policy on Children in Class: While I have a standing policy on children in class for when there is not an active pandemic, it may not be tenable at this time. I encourage you to talk with me about what needs you may have in this area so that we may find the best solution.

Life: Pretty much, if it would help you succeed in this class, let me know and I'll see what I can do.

Academic integrity: It is expected that all students in this course will uphold the honor code which demands that each student live with integrity and discretion in their own life. All assignments, quizzes and exams submitted by students should be of your own hard work and knowledge. The work you do in this class will reflect your retention and comprehension of the material which will benefit you in your future endeavors. As the honor code states: At the heart of growth is the process of learning!

Actually, it does hurt to ask: The grading scale for the course is fixed-- please do not ask me to alter it. I realize that grades can be very important to many students. If you have a grade you're aiming for, it is your responsibility to earn it. I am happy to help you meet your goals and brainstorm learning strategies throughout the course. If you find a grading error on any of your assignments, it is your responsibility to let me know as soon as possible. However, if you ask to have your grade changed (outside of a grading error), I will automatically subtract up to 10 points for the first infraction (and up to 20 for any subsequent infractions).

## Course Schedule

The following is the general schedule for the course. It is subject to change and likely will. Currently all midterms are planned to correspond to when we get through material, not specific dates. The date of the second practical and the due date of the final exam are, however, fixed.

### LECTURE SCHEDULE

Lecture 1	Wed	Sept 6	
			<i>Lab 1: Intro to tools and anatomical language</i>
Lecture 2	Fri	Sept 8	
Lecture 3	Mon	Sept 11	
Lecture 4	Wed	Sept 13	
			<i>Lab 2: Continuation of anatomical language, cells</i>
Lecture 5	Fri	Sept 15	
Lecture 6	Mon	Sept 18	
Lecture 7	Wed	Sept 20	
			<i>Lab 3: Histology</i>
Lecture 8	Fri	Sept 22	
Lecture 9			pre-recorded due to Yom kippur
Lecture 10	Wed	Sept 27	
			<i>Lab 4: Integumentary system</i>
Lecture 11	Fri	Sept 29	
Lecture 12	Mon	Oct 2	<b>Midterm 1 assigned</b> (lectures 1- integumentary system)
Lecture 13	Wed	Oct 4	
			<i>Lab 5: Axial skeleton</i>
Lecture 14	Fri	Oct 6	
Lecture 15	Mon	Oct 9	<b>Midterm 1 due</b>
Lecture 16	Wed	Oct 11	
			<i>Lab 6: Appendicular skeleton</i>
Lecture 17	Fri	Oct 13	
<b>Week 7: Fall Break</b>			
Lecture 18	Mon	Oct 23	
Lecture 19	Wed	Oct 25	
			<i>Lab 7: Joints</i>
Lecture 20	Fri	Oct 27	
<b>Lab practical I (Labs 1-6)</b>	Mon	Oct 30	
Lecture 21	Wed	Nov 1	
			<i>Lab 8: Muscles I</i>
Lecture 22	Fri	Nov 3	
Lecture 23	Mon	Nov 6	
Lecture 24	Wed	Nov 8	
			<i>Lab 9: Muscles II</i>
Lecture 25	Fri	Nov 10	
Lecture 26	Mon	Nov 13	<b>Midterm 2 assigned</b> (skeletal – muscular system)
Lecture 27	Wed	Nov 15	
			<i>Lab 10: CNS</i>
Lecture 28	Fri	Nov 17	



	Mon	Nov 20	<b>Midterm 2 due</b>
	Wed	Nov 22	
	<del>Fri</del>	<del>Nov 24</del>	<b>break</b>
Lecture 29	Mon	Nov 27	
Lecture 30	Wed	Nov 30	
			<i>Lab 11: PNS</i>
Lecture 31	Fri	Dec 1	
Lecture 32	Mon	Dec 4	
Lecture 33	Wed	Dec 6	
			<i>Lab 12: Special senses</i>
Lecture 34	Fri	Dec 8	
Lecture 35	Mon	Dec 11	
<b>Lab practical II (Labs 7-12)</b>	Wed	Dec 13	
<b>Final Exam: (Lessons 30 to 35 and cumulative)</b>			
<b>Posted</b>	<b>Sun</b>	<b>Dec 17</b>	
<b>Due</b>	<b>Fri</b>	<b>Dec 22</b>	

### **Topics**

Anatomical language and organization  
 Molecular movement  
 Homeostasis  
 Cells / Cytology  
 Tissues / Histology  
 Integumentary system  
 Cartilage and bone tissue  
 Skeletal system  
 Joints / Articulations  
 History and ethics  
 Muscle tissue  
 Muscular system  
 Nervous tissue  
 Central nervous system  
 Peripheral nervous system  
 Somatic PNS  
 Autonomic PNS  
 Sensory PNS  
 Special senses