

# BIPN 100

## Human Physiology I

Spring 2025

**Instructor:** Mingyu Yang, Ph.D.  
ymy@ucsd.edu  
**Lecture:** MWF 9:00am-9:50am  
Center 212  
**Office hours:** See Canvas homepage  
Additional meetings by appointment

## Introduction

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### Welcome!

Welcome to BIPN 100! As your professor, I care deeply about fostering a joyful, inclusive classroom climate. Our classroom should be a place where everyone is respected, feels safe to make mistakes, and lifts one another up. Meeting with students is my favorite part of the job, and I look forward to getting to know you all - you can reach me through email, drop-in office hours, or 1:1/small-group appointments. College is a time of tremendous growth, both inside and outside the classroom, and I'm excited to support and celebrate your growth this quarter!

### Course description

The concepts of physiological regulation, controlled and integrated by the nervous and endocrine systems. Structure and function of the muscular, cardiovascular, and renal system, and their relationship with the nervous and endocrine systems.

### Course learning objectives

1. Explain the structure and function of the nervous, endocrine, muscular, cardiovascular, and renal systems.
2. Compare and contrast the structure, function, and regulation of smooth, skeletal, and cardiac muscles.
3. Analyze the endocrine system, including the function of feedback loops, receptors, and different classes of hormones.
4. Describe the organization of the central and peripheral nervous systems.
5. Analyze how neurons communicate with each other and with other cells.
6. Analyze how the electrical activity of the heart impacts the mechanical events of the cardiac cycle.
7. Predict how regulator systems maintain blood flow dynamics and blood pressure.
8. Explain how and where filtration, secretion, and reabsorption of substances occur in the renal system.
9. Analyze the interactions and interdependence between physiological systems through the lens of homeostasis.

### Resources

Optional textbook: "Physiology: An Integrated Approach" (Silverthorn).

## Course components

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### Pre-Class Assignment (PCAs)

Before each class, you will complete a Pre-Class Assignment (PCA), which includes watching 1-2 short videos and completing some assessment problems about those videos. In total, we expect each PCA to take you around 30 minutes, but there is no time limit, so you can take as long as you need. Some videos will review content from prerequisite courses, but most will introduce new ideas that we'll build upon during class. Since this will be your first exposure to the material, the assessment questions will be kept fairly simple by design; in contrast, exams will contain more challenging, application-based problems. For each PCA, you

will receive three attempts, and we'll record your highest-scoring attempt. There will be approximately 25 PCAs assigned over the quarter, and your **highest 20 scores** will count towards your overall course grade. PCAs are due at 9:00am every M/W/F.

### Class sessions

Class time will be a combination of lecture and individual/group problem solving. To participate in class polling, you'll need either a physical iClicker or an electronic device registered with iClicker Cloud. For every class in which you actively participate (responding to >75% iClicker questions), you will receive 1 course point, up to a maximum of 20 points. This allows you to miss approximately 5 classes without penalty. iClicker points are graded for participation and not accuracy. Each class session will be podcasted and posted on the Canvas Media Gallery.

### Concept Checks

There will be an online Concept Check due most Mondays at 9:00am (in addition to the PCA also due on the same day). The specific content coverage of each Concept Check will be listed on the course calendar (see final page of the Syllabus). Some of the questions will be fairly simple to make sure you understood the basic ideas from class, and others will be more difficult exam-style questions. All Concept Checks are **open-book**, **open-collaboration**, and have no time limit – you can and should work together with your peers! You will only have one attempt per Concept Check, but at the end of the quarter we will **drop your lowest-scoring Concept Check** when calculating your final course grade.

### Discussion sections

Every week, we will release a **Problem Set**, containing several problems that are similar in style to exam questions. Since we'll release the answer key at the same time, the Problem Set is ungraded and purely to help you study. During discussion section, you'll work through the Problem Sets in small groups, supported by the instructional staff. Attendance at discussion is optional but highly recommended. You may attend any discussion section of your choice.

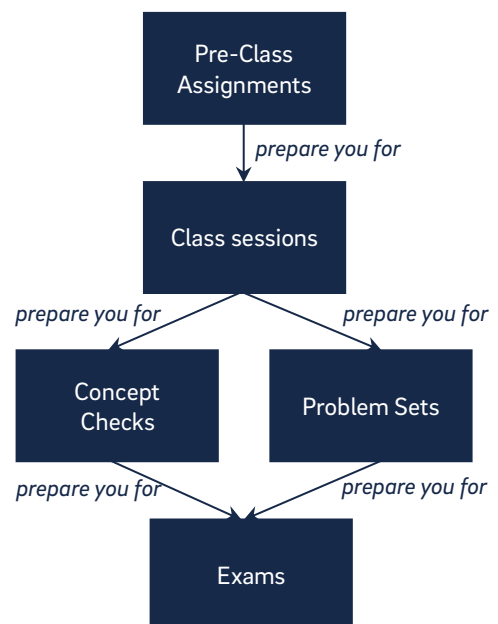
### Exams

There will be two Midterm exams and a Final. The questions will be similar in difficulty to the Problem Sets, Concept Checks, and in-class questions, except that the exams are **in-person**, **closed-book** and **closed-collaboration**. Midterm 2 is non-cumulative and emphasizes new material covered since Midterm 1. The Final Exam will have two parts: Part A is non-cumulative and emphasizes new material since Midterm 2. Part B is fully cumulative and comprehensively covers the entire course. If your score on Part B of the Final Exam is higher than your lowest Midterm, your **score on Part B on the Final will replace your lowest Midterm**.

Because of this policy, we will not offer any make-up Midterms. This policy is also meant to accommodate for missing a Midterm due to illness – the last thing I want is for you to feel pressure to study while you're ill! Note that no part of the Final Exam itself can be replaced.

### Office hours

Office hours are an opportunity to clarify course content and also to chat more broadly about anything you want. You do *not* need to come with any questions prepared; in fact, sitting and listening to everybody else's questions can often help to resurface questions that you didn't even realize you had. Most office hours will be held in a large conference room or a classroom, where you can pop in or out at any time. I will also hold additional 1:1/small-group office hours by reservation, which can be booked through our Canvas homepage. I especially encourage you to make an appointment if you feel like your performance in the class is being impacted by experiences outside of the classroom – I'm here as a resource to support you. Outside of synchronous office hours, you can also ask (and answer each other's) questions on the course **Piazza** forum, which is linked on Canvas.



## Assessment and grading

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The course is graded out of 480 points total. Your total score will be converted to a letter grade based on the following absolute scale. This class is **not curved**; therefore, you are not in competition with each other, and in theory everyone can earn an A grade. Grades will not be rounded; instead, I'll provide everyone a few opportunities for extra credit that *may* 'round you up' if you're close to a grade boundary. I request that you don't ask for additional grade bumps or extra credit opportunities beyond those that are already provided for the entire class – it wouldn't be equitable if I provide additional extra credit opportunities just to the students who ask for it.

A+ ≥ 466	A ≥ 446	A- ≥ 432
B+ ≥ 418	B ≥ 398	B- ≥ 384
C+ ≥ 370	C ≥ 350	C- ≥ 336
	D ≥ 288	
	F < 288	

### Grade breakdown

Midterm 1		80
Midterm 2	(Emphasizes post-Midterm 1 material)	80
Final Part A	(Emphasizes post-Midterm 2 material)	80
Final Part B	(Comprehensive)	80
Concept Checks	(10 pts each, 9 total, drop 1)	80
Pre-Class Assignments	(3 pts each, 25 total, drop 5)	60
Class participation	(1 pt each, 25 total, drop 5)	20
<b>Total</b>		<b>480</b>

### Final Exam grade replacement policies

The goals of the following policies are twofold: to (a) incentivize sustained effort throughout the quarter and (b) reward improvement on the Final. As such, there are two mechanisms for your Final Exam score to replace other components of your grade. These work independently of each other, i.e., you might end up taking advantage of one, both, or neither. These policies are intended as safety nets and should not replace your efforts to engage consistently with all components of the course.

1. If your **score on the Final Part B** is higher than your lowest Midterm score, then that Midterm score will be replaced by your score on Part B. Note that this only applies for one Midterm (not both), and that the Final itself cannot be replaced.
2. If your **total percentage score on Part B** is higher than your class participation score, then your participation score will be replaced by your percentage on Part B. For example, if your participation score is 10/20 (= 50%) and your Final Part B score is 72/80 (= 90%), then the participation score will be replaced with 18/20 (= 90%). That said, you should still make every effort to attend class, and treat class participation as 'free points' that can reduce the weight of the Final.

## Course policies

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### Academic accommodations

If you need academic accommodations due to a disability, please send Ming a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities ([osd.ucsd.edu](https://osd.ucsd.edu)). We'll schedule accommodations for the Midterm and Final exams directly with the Triton Testing Center.

### **Late policy**

We will not accept any late work in this class. This way, we'll be able to release answer keys for PCAs and Concept Checks immediately when they're due. The drop policies will help to buffer your grade if you miss a deadline.

### **Regrade policy**

If you believe an exam question was graded incorrectly, you must submit a hardcopy regrade request to Ming before the last day of class. Your request should explain which question you'd like regraded and specifically why your answer was similar to the answer key. At the end of the quarter, I will first calculate your final grade *without* any regrades factored in; if the regrade has the potential to bump your score up to the next letter grade, I will process your regrade request. Your score may go up or down as a result of the regrade. (Many students typically receive an 'A' without needing the regrade!)

### **Academic integrity**

By upholding high standards of integrity in this class, you can be confident that every student is fairly assigned the grade that they earned. This means you should never misrepresent somebody else's work as your own; for example, during class time, you should only click in for yourself and not your peers. In addition, although PCAs and Concept Checks are collaborative and open-resource (including artificial intelligence tools), your submission should ultimately represent your own effort. You should be able to defend all your answers, so please do not blindly copy from your peers or from the Internet. Getting into bad habits early on will prepare you poorly for exams, which are closed-book and closed-collaboration. Ultimately, we trust you to succeed with integrity, and we have no interest in policing your behavior. Please return our trust by behaving with honesty.

### **Anonymous feedback**

The class Canvas page links to an anonymous feedback form that will be open throughout the quarter. Only Ming has access to this form, and there will be no way to trace the response back to you. We especially encourage you to complete the form if you had an experience that was demeaning, intimidating, offensive, or threatening in any way. If I said anything in class that came across this way, this is also a good place to tell me (although I welcome non-anonymous feedback too!). Remember, my email inbox and office hours are always open to you, if you want me to follow-up directly with you.

### **Extenuating circumstances**

I sincerely believe that everyone can succeed in this class. However, extenuating circumstances may arise that negatively impact your ability to participate in the course (for example, needing to miss more classes than the drop policy accommodates for). If you find yourself needing additional accommodations or support, please reach out to your college's Dean of Student Life, and I will work together with both you and your Dean to plan a path forward. There are two reasons for this policy: (1) If you find yourself needing additional accommodations because of an extenuating circumstance, this is likely affecting your participation in all your classes, not just this one. Your Dean of Student Life can help coordinate with *all* your course instructors, so you won't have to figure it all out alone. (2) As your professor, I don't think it's right for me to be the arbiter or who does or does not 'deserve' additional accommodations – I think this responsibility should be for someone whose full-time job (and professional training) is in student support. I will commit to putting my best-faith effort to working with your Dean to ensure you receive the support and flexibility you need.

### **Parting remarks**

The main goals of this course are for you to learn a lot, build a class community, and have a wonderful experience while doing so. Welcome to BIPN 100!

## Schedule of topics

(subject to change)

Week	Date	Class	Concept Check (due 4pm)
01	Mar-31	01 Homeostasis and Feedback	
	Apr-02	02 Membrane Potentials	
	Apr-04	03 Graded Potentials	
02	Apr-07	04 Action Potentials	Concept Check 1: Classes 01-03
	Apr-09	05 Synaptic Transmission	
	Apr-11	06 Central Nervous System	
03	Apr-14	07 Sensory Systems	Concept Check 2: Classes 04-06
	Apr-16	08 Somatic Motor System	
	Apr-18	09 Skeletal Muscle	
04	Apr-21	10 Mechanics of Movement	Concept Check 3: Classes 07-09
	Apr-23	11 Autonomic Nervous System	
	Apr-25	<b>Midterm 1: Classes 01-09</b>	
05	Apr-28	12 Smooth Muscle	Concept Check 4: Classes 10-11
	Apr-30	13 Hormone Release	
	May-02	14 Hormone Effects	
06	May-05	<b>No class: Ming travelling</b>	Concept Check 5: Classes 12-14
	May-07	15 Cardiac Muscle	
	May-09	16 Wiggers Diagram	
07	May-12	17 Electrocardiograms	Concept Check 6: Classes 15-16
	May-14	18 Regulation of Cardiac Output	
	May-16	19 Pressure-Volume Loops	
08	May-19	20 Regulation of Blood Pressure	Concept Check 6: Classes 17-18
	May-21	<b>Midterm 2: Classes 10-18</b>	
	May-23	21 Peripheral Circulation	
09	May-26	<b>No class: Memorial Day Holiday</b>	
	May-28	22 Kidney Structure and Function	Concept Check 8: Classes 19-21
	May-30	23 Reabsorption and Secretion	
10	Jun-02	24 Excretion and Clearance	Concept Check 9: Classes 22-23
	Jun-04	25 Regulation of Fluid Osmolarity	
	Jun-06	26 Integrative Control of Fluid Volume	
11	Jun-11	<b>Final Exam: Comprehensive</b>	