

IB 132 Human Physiology Spring 2021

Lecture: Tuesdays and Thursdays 9:30 to 11:00 am, Synchronous on Zoom with recordings in bCourses.
**Instructors: George A. Brooks (gbrooks@berkeley.edu), José Pablo Vázquez Medina (jpv-m@berkeley.edu),
 and Daniela Kaufer (danielak@berkeley.edu)**

<u>Topic</u>	<u>Chapter</u>	<u>Week</u>	<u>Date</u>	<u>Lecturer</u>
1. Homeostasis and Control in Physiology	1	1	1/19	JVM (GB, DK)
ATP homeostasis	2, 3	1	1/21	GB
2. Signaling, Homeostasis And Control In The Human				
Membranes	4, 5	2	1/26	JVM
Nervous System	6	2/3	1/28, 2/2	DK, DK
Sensory Physiology	7	3/4	2/4, 2/9	DK, DK
Brain & Behavior	8	4/5	2/11, 2/16	DK, DK
Muscles	9	5	2/18	GB
Motor Control	10	6	2/23	GB
----- MT 1 Material Delineation -----				
3. Endocrine Control Systems	11	6,7	2/25, 3/2	JVM, JVM
<i>MIDTERM 1</i>		7	3/4	
4. The blood	12	8	3/9	GB
Blood Pressure Control: Heart and Circulation	12	8,9	3/11, 3/16	GB, GB
<i>SPRING BREAK</i>		10	3/22-3/26	
5. Control of Blood O ₂ and CO ₂	13	9/11	3/18, 3/30	GB, GB
6. Control of Body Water and Ion Composition (Renal Physiology)	14	11,12	4/1, 4/6	JVM, JVM
----- MT 2 Material Delineation -----				
7. Nutrition and Digestion	15	12	4/8	GB
8. Control of Blood Glucose, Energy Balance	16	13	4/13	GB
<i>MIDTERM 2</i>		13	4/15	
9. Homeostasis of the Self: Reproduction	17	14		
Male Reproductive Physiology			4/20	JVM
Female Reproductive Physiology			4/22	JVM
10. Homeostasis of the Self: Immune Response	18			
Innate Immune System		15	4/27	JVM
Adaptive Immune System		15	4/29	JVM
<i>FINAL EXAMINATION</i>			5/13 11:30 AM-2:30 PM	

* Assigned Readings are in Vander's HUMAN PHYSIOLOGY, 15th Edition, McGraw-Hill, 2018

Loose-Leaf Vander's Human Physiology 15th edition
ISBN: 9781260231571

eBook Vander's Human Physiology 15th edition
ISBN: 9781260231625

From the bookstore: <https://calstudentstore.berkeley.edu/ebook/9781260231625>

The book can also be purchased directly from McGraw-Hill:

<https://www.mheducation.com/highered/product/vander-s-human-physiology-widmaier-raff/M9781259903885.html#buying-options>

Course objective: to understand the mechanisms by which key physiological priorities are maintained in healthy humans. From a basis in elementary theories of information and control, we develop an understanding of homeostasis of cellular composition, structure, and energy metabolism. We then study neural and endocrine signaling in humans, and develop the key concepts of control and homeostasis in all the major organ and multi-organ systems, including cardiovascular, respiratory, renal, metabolic, reproductive, sensory and motor systems.

Key physiological Priorities:

Cell membrane potential: -90 to -55 mV (depending on cell type)

Atkinson Energy Charge: 0.85

Mitochondrial $\Delta\Psi$: 0.20 V

Blood [glucose]: 100 mg/dl or 5.5 mM

Mean Arterial Pressure: 100 mmHg or Torr

Arterial pH: 7.38

Arterial Oxygen Partial Pressure: 100 Torr

Plasma Osmolality: 282 mOsm

Core Body temperature: 37°C

Course Text: Vander's HUMAN PHYSIOLOGY, 15th Edition, McGraw Hill, 2018.

The text contains questions at the end of each section and chapter for you to test your comprehension of the main topics. The following chapters from the book will be part of the examinations:

Midterm 1: chapters 1-10

Midterm 2: chapters 11-14

Final exam: All of the above plus chapters 15-18

Although most information to be tested is contained in the book, we present information in lectures that is not contained in the book, and there is often detail in the text that we will not test. Attending lectures allows you to judge how we will weight topics covered in the text, to learn material not covered in the text, and to interact with your classmates instructors and GSIs. To prepare, please read the relevant chapters before class.

Discussion section: Discussion sections will include group work analyzing case studies and solving problems. Some written assignments will be completed during sections. There will be 12 section meetings; the grade will be determined from participation and work from 10 of them. Missed discussion section work **cannot be made up**.

Grading: All exams will be closed book, closed notes. No electronic devices will be necessary or allowed during exams. Although most information to be tested is contained in the book, we present information in lectures that is not contained in the book, and there is often detail in the text that we will not test. Attending lectures allows you to judge how we will weight topics covered in the text, to learn material not covered in the text, and to interact with your classmates and us. To prepare, please read the relevant chapters before class.

The course grade will be determined by scores on discussion section work, two midterm exams, and a final exam.

The weighting of these five components will be:

20% Discussion section participation and in-class quizzes

20% Midterm 1 (multiple choice test, in class)

20% Midterm 2 (multiple choice test, in class)

40% Final exam (multiple choice test, cumulative)

Letter grades:

If your final course score is: Your final letter grade will be:

≥ 95% A+ ≥ 83% B+ ≥ 73% C+ ≥ 63% D+

≥ 90% A ≥ 80% B ≥ 70% C ≥ 60% D

≥ 87% A- ≥ 77% B- ≥ 67% C- < 60% F

Midterm exams: Midterms will be multiple choice exams administered online.

Final exam: The final will be a multiple choice exam administered online.

Absence from exams: If you cannot attend an exam due to illness or other circumstances beyond your control, you must contact one of the instructors and explain the circumstances **before** the exam. You will need to provide documentation of the circumstances (in the case of illness, a doctor's note specifying why you could not attend the exam). There will be no makeup examinations, but we will consider the possibility of alternative assessment under justified and documented circumstances.

Honor Code: You will be asked to sign an Honor Code statement at each exam, stating that you will not give or receive aid in the examination. We will manifest our confidence in you by refraining from proctoring examinations or taking unusual precautions to prevent cheating. The penalty for violating the Honor Code will be failing the course. A complete statement of our Honor Code is available under 'Resources' on the course bSpace site.

All class materials such as lectures posted on bCourses, exams, study questions, discussion work sheets and laboratory materials are property of the Instructors and The UC Regents. **They shall not be posted on the web on Course Hero or any other site.**

Lecture Notes: PDFs of Lecture Notes will be available on the class bCourses site. We will try to post Lecture Notes the evening before lectures, but we cannot guarantee that they will always be posted before lecture.

DSP students: please contact Professor George Brooks (gbrooks@berkeley.edu) or José Pablo Vázquez-Medina (jpv-m@berkeley.edu) at least 2 weeks before the first midterm, so that we can plan the necessary accommodations.

Electronic Mail Policy: Questions on lecture material will be answered in class and during office hours only. **Email is reserved for emergency purposes.**

Lectures: Tues/Thurs 9:30-11:00am, synchronous on Zoom. Lecture recordings and slides will be made available on bCourses before each class. We highly encourage you to attend the live sessions. The class is heavily based on discussion and interaction.

Zoom Link: Join from the bCourses site. If you need a direct link:

URL: <https://berkeley.zoom.us/j/91528362158?pwd=Q2N4NmgyY1gya0cwRlA3OGFrR0JYQT09>

Passcode: 899666

Zoom Etiquette: We ask that you turn on your video in lecture and in section to encourage community building. Please let your GSI know if there are any concerns or questions. We will start on Berkeley time to give students an opportunity to have a break between classes. Please be on time, use your real name, and mute your microphone when you aren't talking. GSIs will be attending each lecture and answering questions in real time using the chat function.

Discussion Groups: 1 hour/week REQUIRED

You need to be enrolled and attending in one of the nine sessions.

Office Hours:

Instructors:

Dean Professor Daniela Kaufer (danielak@berkeley.edu)

OFFICE HOURS: Tuesdays, 11:30-12:30 Only during lecture days 2/2-2/16/21

Professor George A. Brooks (gbrooks@berkeley.edu),

OFFICE HOURS: Mondays and Wednesdays 9:00-10:00

Professor José Pablo Vázquez Medina (jpv-m@berkeley.edu)

OFFICE HOURS: Wednesdays, 9:30-11:00

Labs: IB 132L, the laboratory course corresponding to IB 132, is synchronized with the lecture class, and is best taken concurrently. However, lab enrollment is severely limited by constraints on space, equipment and GSI time, so the lab seats are available to only 160 students per term. If you are one of those with a seat in a lab, please make use of it, or drop the lab early in the semester so that another student has the opportunity. Transfers between sections will not be allowed. Lab grades are determined by work in the lab, and are independent of lecture class grades.

