

This course is an introduction to physiology and will cover the endocrine system, the nervous system, the musculoskeletal system, the circulatory system, and the urinary system. This course will also introduce how physiological knowledge is used to diagnose and treat diseases.

Information that was covered in prerequisites (e.g., BILD 2) is a basis for the class. In addition, you also need to review basic calculus, physics, and chemistry.

LECTURES: Tuesday and Thursday 8:00a - 9:20a PETER 108

SECTIONS ARE STARTING IN WEEK2 (MONDAY, Jan 14): The sections are designed to provide a forum for you to ask questions about the course material, receive additional instruction, and receive help with solving problem sets.

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|-----|--------|----|---------------|-----|-------|--|
| B01 | 962080 | M | 8:00a-8:50a | WLH | 2112 | |
| B02 | 962081 | Tu | 8:00p-8:50p | APM | 2301 | |
| B03 | 962082 | Tu | 9:00p-9:50p | APM | 2301 | |
| B04 | 962083 | Th | 7:00p-7:50p | WLH | 2209 | |
| B05 | 962084 | M | 10:00a-10:50a | HSS | 2154 | |
| B06 | 962085 | W | 10:00a-10:50a | HSS | 2154 | |
| B07 | 962086 | F | 5:00p-5:50p | HSS | 2154 | |
| B08 | 962087 | M | 4:00p-4:50p | HSS | 1305 | |
| B09 | 962088 | F | 11:00a-11:50a | APM | 2301 | |
| B10 | 962089 | M | 3:00p-3:50p | WLH | 2206 | |
| B11 | 962090 | M | 12:00p-12:50p | HSS | 1128A | |

Attendance at the section you are signed up for is optional, but will count for 5 % extra credit. Full extra credit for attendance will be given for attendance at more than 75 % of the discussion sections that will be held for your time slot. If you attend fewer than 75 % of sections, you will receive partial credit. Attendance will be monitored by a sign-up sheet, which will be available until 5 minutes after the start of the section. **You will only receive credit for attending the section that you signed up for.** If you have to miss your assigned section in a particular week, you are welcome to attend another section as long as space is available, **but you will not receive attendance credit.**

OFFICE HOURS (STARTING WEEK 2):

Dr. Leutgeb: **Tuesday 9:30-10:30a Pacific Hall 3501**
Instructional Assistants' Office Hours will be announced on TritonEd.

Each instructional assistant and the instructor will hold one office hour per week as long as office hours are well-attended. We will make every effort to offer an additional review session before each exam but this will be contingent on the availability of a lecture hall outside of our regular lecture time. All office hours will be open to groups of students. If you need to discuss matters other than the course material, please make an appointment for a meeting with the instructor by sending an e-mail. Make sure to mention BIPN 100 in the subject line.

TEXT AND READINGS: Silverthorn. *Human Physiology: An Integrated Approach*, 7th edition or online edition. You are also welcome to read the corresponding topics in the 8th edition. The e-version of the book is available through a link in Triton ed. **Please note that your student account will be charged for the online book unless you opt out. You will need to read sections from the text book in preparation for the reading quiz at the beginning of each lecture.**

COURSE WEB SITE. There will be a TritonEd site for the course <<http://triton.ed.ucsd.edu>>. **Announcements, updates, postings, lecture slides, class discussion forums, clicker scores, and exam grades will be communicated using TritonED.**

CLICKERS. Clickers will be used throughout the lectures, and **10 % of the grade will be earned by correctly answering *reading quiz questions* at the very beginning (8 am!) of each lecture and by responding (either correctly or incorrectly) to *discussion clicker questions* throughout the lecture.** The **reading quiz questions** will be on topics that are covered in the **required** readings for each lecture or on topics that were covered in the previous lecture. **Discussion** questions are on topics that will be discussed with your peers during the lecture. Although it is irrelevant whether discussion questions are answered correctly or incorrectly, **it is expected that students participate in the discussion.**

Full credit for clicker questions will be awarded if 75% of all possible clicker points are earned. If less than 75 % of all clicker points are earned, you will receive partial credit. Questions during the first week of classes will not count. Some lectures have more and some lectures have fewer clicker questions, but your points **will not be corrected for the number of questions per class. Furthermore, no adjustments will be made for forgotten clickers or for any technical difficulties (e.g., running out of batteries).** It is your responsibility to bring your clicker to class and to have it in working condition.

Please register your clicker using TritonED by the end of week 1 and do not switch clickers at any time during the quarter. Clicker points will first be posted by the end of week 2. If you do not see your points at that time, please let the instructor know immediately. Errors in registration will result in a loss of points that cannot be assigned at a later time throughout the quarter. **Each student's responses to clicker questions will be posted on TED several times during the quarter so that you can estimate whether you are on track for receiving full extra credit.**

PODCASTS OF LECTURES. Lectures will be podcast <podcast.ucsd.edu> as long as students are using this as a resource and not as a replacement for attending class. Audio files and screens are included.

ELECTRONIC COMMUNICATION. You can ask questions about the course material by posting a message on TritonED. For all questions about the course material, please use the **Discussion Board on TritonED** rather than the instructor's e-mail such that your questions and the answers will be available to others in the class. Please use the e-mail address of the instructor (sleutgeb@ucsd.edu) only for matters that **require** the instructor's personal attention and **be sure to include <BIPN 100> in the subject line.**

PROBLEM SETS. During most weeks, problem sets will be posted. These are intended for practice **and do not need to be turned in.** Problems/questions require that you **use** information and critical thinking skills. A typical exam question may state an experimental observation and ask you to apply what you have learned in order to explain, interpret, or predict something. Problem sets will typically be posted by Friday of each week so that you can work on them for a couple of days before they will be discussed in sections during the following week. Solutions to the problems will be (a) discussed in sections and (b) posted on WebCT **after the final section of each week meets (on the Friday following the Friday after the problem was posted).** **All information introduced to you on problem sets is part of the course material.** You may see questions on exams that are based on information that was presented **only** in a problem set, so be sure to study the problems as part of the course.

TO DO WELL ON EXAMS, YOU MUST PRACTICE SOLVING PHYSIOLOGY PROBLEMS BEFORE THE EXAMS. Physiologists think in terms of "word problems," not in terms of memorization.

You are most likely to do well in the course if you approach the study of physiology as you would physics or math. That is, **do the problems in writing on paper by yourself** or in a study group in which you *actively* participate. You cheat yourself if you just read the solutions and say "Oh yeah, that makes sense." People who study passively by reading and then writing an outline of the text or recopying their notes, skipping the problem sets or maybe just reading through them, are often surprised at how difficult they find the exams, whereas students who work the problem sets typically do very well on the exams. **PRACTICE IS IMPORTANT, and recopying your notes is not practicing the skills of problem-solving.**

HOW TO GET THE MOST OUT OF THE PROBLEM SETS:

Step 1: For each problem set, begin your work by treating it like a closed-book exam: that is, write the best, most complete answer you can on paper.

Step 2. THEN **improve** your answers by consulting your lecture notes, Course Outlines, textbook, Podcasts, etc.

Step 3. FINALLY (and not before steps 1 and 2) compare your answers with the solutions to the problem set, **concentrating on the DIFFERENCES between your answer and the answer on the key.** The similarities indicate what you know—and that's good—but the differences indicate what you don't yet know or don't yet understand.

Your textbook includes questions at the end of each chapter. Solving these problems will give you further practice. Some of problems from the chapters may be included in each week's posted problem sets.

EXAMS AND GRADING:

1. GRADING: Your grade for this course will be based on your performance **on two midterm exams, on the final, and on answering clicker questions.** The exams will be multiple choice questions, but may also include short answer questions and problems. The first midterm exam will be worth approx. 60 points, the second approx. 100 points, and the final exam will be worth approx. 200 points. Clicker scores will add 40 points for a total of about 400 points WITHOUT extra credit. **Full extra credit for attending discussion sections will add 20 points. There will also be 10 extra credit points for each student if > 80 % of all enrolled students respond to CAPE.**

2. EXAM SCHEDULE:

| | | |
|-----------|------------------------------|-----------------------|
| Midterms: | Thursday, January 24 | 8:00a - 9:20a |
| | Thursday, February 21 | 8:00a - 9:20a |
| Final: | Thursday, March 21 | 8:00a - 11:00a |

Exam locations will be announced in class and on TED. If no changes are announced, the midterms and the final will be in the lecture hall.

3. MAKE-UP EXAMS: You are expected to take the exams when they are scheduled. To be fair to your fellow students, make-up exams can be arranged **only** in the following three circumstances.

A. You are too ill to take the exam. In order to be excused from an exam or to take a make-up exam (the instructor decides which is most appropriate for you) you must e-mail Dr. Leutgeb and let him know that you are ill as soon as it is possible to do so (before the exam, if it is at all possible). Wrongly excusing yourself from an exam as being ill will be considered **academic dishonesty and will have all the**

consequences that are listed below.

B. You have an extremely pressing need to be out of town at the time when the exam is scheduled (not the day before or the day after) AND you have arranged a make-up exam or to be excused (the instructor decides which is most appropriate for you) at least one week in advance. You cannot be excused from an exam after the fact. It will help in making these arrangements if you bring written confirmation of your need to miss the regularly scheduled exam when you ask to schedule a make-up exam. In any case, you will also need to bring the corroborating documents before the end of the quarter.

C. You are taking an exam **for a course that is required for academic credit toward graduation** and the exam time overlaps with the exam time of BIPN100 AND you have arranged the make-up exam at least one week in advance. You must bring corroborating documents to the make-up exam.

Your last chance to schedule a make-up exam for the circumstances that are listed in B and C is by talking to Dr. Leutgeb after the class that is held one week before the day of the exam. If you fail to talk with an instructor before or at that time, you must take the exam as scheduled (unless you are too sick--see part A above).

PLEASE NOTE: Having another mid-term scheduled on or near the day of our mid-term is not a reason to take a make-up exam. Having another finals scheduled on or near the day of our final is not a reason to take a make-up exam.

4. GETTING BACK GRADED EXAMS: Midterm exams (but NOT scantrons) will be made available at the exam depot on the first floor of Pacific Hall. Final exams will not be made available.

5. GRADES: All the points that each student earned on three exams (two midterms and a final) and for answering clicker questions will be totaled. **The final course grade will be determined either by using a standard curve or a straight grading scale. The scale that yields the better average grade for the entire class will be selected.** For the straight scale, the top five scores of each exam will be averaged, and that average will be considered "100%." An A will be 90% and above, a B 80%-89%, a C 70%-79%, and a D 60%-69%. Plus or minus signs will be added for grades within 2% of the cutoff between letter grades. For the standard curve, I will calculate the mean and standard deviation. An A will be assigned for scores that are greater than one standard deviations above the mean, a B for scores that are above the mean, a C for scores that are below the mean, a D for scores that are more than one standard deviation below the mean, and an F for scores that are more than two standard deviations below the mean. **Extra credit will not be included in the calculation of the grading scale and will thus result in better grades without affecting the calculation of the cutoffs.**

6. REGRADES: If you have an objection to a **particular exam question**, you have 24 hours from the end of the exam to raise your concerns. Objections to exam question must be made in person with a prepared, written argument of why that question was unfair. A decision will then be made whether to not grade that question for the entire class.

If you have objections to the grading of a short answer on **your** exam, you can e-mail a written argument to the teaching assistant who graded the question. **The e-mail has to be received within a week after the exams are available at the depot. You then have to meet with the TA during her/his next office hour.** If you and the TA do not agree, you can e-mail a written petition and a copy of your exam to the instructor. Note that a regrade by the instructor may result in a gain or loss of points; regrading may not be limited to the question you petitioned about. Graded exams will be randomly copied before being returned. If you are found altering your answer to an exam question and resubmitting that question for a regrade, you will be given a zero on the entire exam and reported for academic dishonesty. Note that false

statements that are sent by e-mail or put forward in person are also grounds for being reported for academic dishonesty.

7. ACADEMIC DISHONESTY: All suspicions of academic misconduct will be reported to the Academic Integrity Office according to university policy. Academic misconduct is not just blatant cheating (e.g., copying off another student during an exam), but also includes what you might have thought of as "minor cheating" in high school. In addition, academic misconduct includes **writing e-mail that includes fabricated statements, using other student's clickers, and faking a family emergency or medical condition.** The Policy on Integrity of Scholarship (academicintegrity.ucsd.edu) and this syllabus list some of the standards by which you are expected to complete your academic work, but your good ethical judgment (or asking for advice) is also expected as we cannot list every behavior that is unethical or not in the spirit of academic integrity. Any student caught cheating on an exam will receive a zero for that exam. Any student caught cheating with clickers will not receive any clicker points. **Cheating by answering clicker questions for another student or by giving your clicker to another student will be considered as severe as taking another student's exam** and will thus result in the loss of all clicker points for both of the involved students and in the reporting both students to the Academic Integrity Office.

In addition to losing points, the academic sanction for academic dishonesty can also be an F for the entire class. Furthermore, a student who is found to have committed academic misconduct will not only face the mentioned academic sanctions imposed by the instructor, but will also face **administrative sanctions imposed by the college's Dean of Student Affairs.** Standard administrative sanctions include: the creation of a disciplinary record (which will be checked by graduate and professional schools), disciplinary probation, and attendance at an Academic Integrity Seminar, and an administrative fee. Students can also face suspension and dismissal from the University. **Administrative sanctions are not at the instructor's discretion,** and the appropriate sanctions will be determined based on the egregiousness of the Policy violation. Students who assist in or are complicit with cheating could also be in violation of the Policy. Thus, students who become aware of their peers either facilitating academic misconduct or committing it should report their suspicions to an instructor for investigation.

See <http://weber.ucsd.edu/~dkjordan/resources/cheat.html> for additional information.

SCHEDULE OF CLASSES AND TOPICS:

The topics, **required readings (in bold)**, and recommended readings (in regular font) may be adjusted depending on the progress throughout the quarter.

| | Date | Topic | Assigned Readings, Silverthorn, 7th ed Chapter (page numbers) |
|-----------|-------------------|---|--|
| 1 | January 8 | Homeostasis, diffusion, and transport | Homeostasis (10-13), Homeostasis Does Not Mean Equilibrium, Osmosis and Tonicity, Transport Processes, Diffusion, Protein-Mediated Transport (124-147) |
| 2 | January 10 | Endocrine system | Hormones, The Classification of Hormones (198-206) Control of Hormone Release, Hormone Interactions, Endocrine Pathologies, Hormone Evolution (207-222) |
| 3 | January 15 | Renal physiology | Functions of the Kidney, Anatomy of the Urinary System, Overview of Kidney Function (590-596) Filtration, Reabsorption, Secretion, Excretion, Micturition (597-614) |
| 4 | January 17 | Control mechanisms for osmolarity | Fluid and Electrolyte Homeostasis, Water Balance (619-629) |
| 5 | January 22 | Control mechanisms for sodium and volume | Sodium Balance and ECF Volume, Potassium Balance (630-636) |
| M1 | January 24 | MIDTERM EXAM | |
| 6 | January 29 | Introduction to the nervous system | Organization of the Nervous System, Cells of the Nervous System (228-236) The Resting Membrane Potential (153-159) |
| 7 | January 31 | Graded potentials and action potentials | Electrical Signals in Neurons (237-253) |
| 8 | February 5 | Synapses | Cell-to-Cell Communication in The Nervous System (254-260) Integration of Neural Information Transfer (261-269) |
| 9 | February 7 | The central and peripheral nervous System | Anatomy of the Central Nervous System, The Spinal Cord, The Brain (278-290) The Autonomic Division, The Somatic Motor Division (360-374) |
| 10 | February 12 | Sensory systems I | General Properties of Sensory Systems (311-317) Somatic Senses (318-324) |
| 11 | February 14 | Sensory systems II | Chemoreception: Smell and Taste (325-329) The Ear: Hearing, The Ear: Equilibrium, The Eye and Vision (330-354) |
| 12 | February 19 | Motor systems | Muscles, Skeletal Muscle (377-398), Smooth Muscle, Cardiac Muscle (404-413) Neural Reflexes, Autonomic Reflexes, Control of Movement in Visceral Muscles, Skeletal Muscle Reflexes, The Integrated Control of Body Movement (419-431) |

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|-------------------|--------------------------|--|--|
| M2 | February 21 | MIDTERM EXAM | |
| 13 | February 26 | Introduction to the cardiovascular system | Overview of the Cardiovascular System (437-439), The Blood Vessels (478-482) Exchange at the Capillaries, The Lymphatic System (497-501) |
| 14 | February 28 | Pressure, volume, flow, and resistance | Pressure, Volume, Flow, and Resistance (440-443) |
| 15 | March 5 | Signal conduction through the heart and the electrocardiogram | Cardiac Muscle and the Heart (444-454) |
| 16 | March 7 | The cardiac cycle | The Heart as a Pump (455-473) |
| 17 | March 12 | Regulation of cardiac function, blood pressure, blood volume, osmolarity, and pH | Blood Pressure, Resistance at the Arterioles (483-491) Distribution of Blood to the Tissues, Regulation of Cardiovascular Function (492-496) |
| 18 | March 14 | Integrated function and review | No required readings |
| FINAL EXAM | Thursday March 21 | 8:00a - 10:59a Room TBA | |

INSTRUCTIONS FOR TAKING EXAMS

The exams in this course are closed book, closed notes, and electronics-free. That is, you must use only what is in your brain to answer questions. Using anything else (e.g., electronic devices or someone else's exam) constitutes a breach of academic integrity and will be treated accordingly. We will enforce all of the following conditions. You can minimize the time it takes to get set up for an exam--and thus maximize the time you have available to complete the exam by learning the rules and following them without being reminded. YOU have the power to make exams go efficiently and smoothly or not, which will eat into your time for the exam.

1. Students will sit every-other-seat if there is sufficient seats in the room. Your TAs will tell you the seating arrangement in your room.
2. All electronic devices must be turned off and stored in a bag/backpack that is placed under your desk. This rule applies to cell phones, calculators, notebooks, audio devices, and wrist-held devices. Setting your cell phone to "vibrate" is not sufficient, and putting devices into your pockets is not the same as putting them under your desk. If we can see or hear an electronic device, we will confiscate it. If there is any suspicion that the device could have been used for cheating, it will be reported as outlined under the academic dishonesty section.
3. All of your belongings--except what you will write with and a water bottle--must be placed UNDER the seat that YOU are sitting in. Please don't put anything on the desk next to you, on the floor in front of you, or anywhere else except under your desk where you can't see them and we can't trip over them.
4. Hats can either be removed or turned with the bill to the back of your head. Once the exam begins, you can't touch your hat, wherever it is. Hooded sweatshirts or jackets must be worn with the hood down, not on your head or covering your face.
5. You can write either with a pen or with a pencil. Please use whatever allows you to write legible answers. If the person grading your answer can't read it, you will not be given credit, so keeping your exam neat and legible is definitely in your best interest. **YOU HAVE TO USE PENCIL ON SCANTRONS, BUT IF YOU USE PENCIL FOR SHORT ANSWER QUESTIONS, WE CANNOT CONSIDER REGRADE REQUESTS.**
6. **BRING YOUR UCSD ID CARD TO EVERY EXAM.** You will have to show it when you turn in your exam.
7. Be sure to turn your exam in as you leave the exam room. Don't take any exam materials with you when you leave. You may be asked to leave through a particular door.
8. Put your name and ID number on EVERY page. We may take the exams apart, and if pages are unlabeled, we won't know whose they are. Put your seat number on the first page of the exam.
9. Depending on circumstances, we may or may not be able to allow restroom breaks. Arrive early at the exam room to learn how this issue will be handled.
10. You can use the backs of pages as scratch paper. If you need to write something on the back of a page and you want us to grade it, you must get explicit permission from an instructor BEFORE you begin writing on the back of the page.