

Fall 2015

BIOS 1303

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University of New Orleans

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THE HEARTBEAT of
the **CRESCENT CITY**

The University of New Orleans

Department of Biological Sciences
Human Anatomy & Physiology Lecture, Part 1
Fall 2015 Liberal Arts Bldg Rm 140
MWF 11:00am-11:50pm
BIOS 1303 Section 001

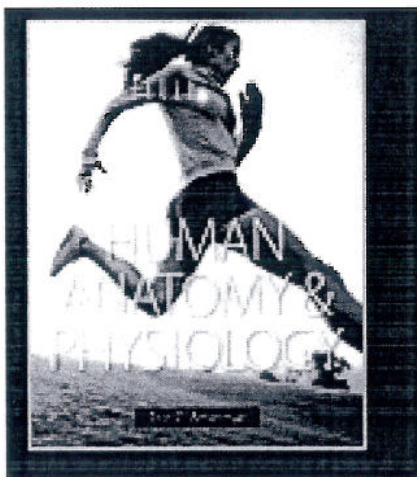
Instructor

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Office Hours: M Tu W 12:30 - 2:30

Course Description

This is an introductory course dealing with structural and functional relationships of the human organism at the cellular, tissue, organ and system levels. This course covers general principles in biology and a detailed study of the skeletal, muscular, nervous systems of humans. This course is primarily designed for nursing and allied health students as well as pre-professional majors, such as pre-medicine, pre-dental, pre-veterinarian. The prerequisites for this class is eligibility for enrollment in or credit for ENGL 1157 and MATH 1125 or credit for higher level English or Math.

Textbooks & Resources Required



Human Anatomy & Physiology. Eric Ammerman. Pearson Publishing

You will also be required to purchase the Mastering A & P On-Line Resource.
The registration details can be found on Moodle.

Class Code:MAPNESBIT83462

Once registered for Mastering A & P, register for Learning Catalytics. The link for Learning Catalytics can be found on the right side of your Mastering A & P home page. Directions for access can be found on Moodle.

Bookstore Pricing:
Text with Mastering 227.50

3 hole punch text plus Mastering 190.25

Text + Lab Manual + Mastering 377.50

Mastering Standalone with etext 114.50

Course Objectives

By the end of this course students will be able to:

- Describe the anatomic position and its importance in the study of anatomy.
- Describe the anatomic planes and sections through the body and define the different anatomic directional terms as well as the proper anatomic terminology for major regions of the body.
- Describe the body cavities and explain the role of serous membranes.
- Define homeostasis and the components of a homeostatic system and recognize each component in representative systems.
- Define negative and positive feedback systems.
- Summarize the general concepts of passive and active transport.
- Define diffusion, facilitated diffusion, osmosis and tonicity.
- Name the classes of epithelia based on cell layers and shapes. Give examples of each type of epithelium.
- Describe the components of connective tissue and distinguish the types of connective tissue and the locations where each is found.
- Describe the five layers of the epidermis and characterize the two layers of the dermis.
- Describe the structure of a hair and a hair follicle.
- Describe the process of wound healing and classify burns.
- Compare and contrast spongy and compact bone.
- Explain the structural components of a long bone.
- Describe the composition of bone's matrix and the four types of bone cells and their functions.
- Compare interstitial and appositional growth of cartilage and bone.
- Explain endochondral ossification, bone growth and bone remodeling.
- Describe the regulation of blood calcium levels.
- Know the classification of bone fractures and the process of fracture healing.
- Define a joint and compare the structural and functional classification of joints.
- Describe the characteristics and basic features of a synovial joint.
- Describe the movements of synovial joints.
- Know the components of the glenohumeral and knee joints.
- Describe the microanatomy of skeletal muscle.
- Explain the events that lead to release of acetylcholinase from a motor neuron.
- Describe the steps in excitation-contraction coupling and crossbridge cycling.
- Describe the organization of the nervous system.
- Describe the basic anatomic features common to most neurons.
- List the distinguishing features of glial cells.
- Explain the distribution of pumps and channels in the plasma membrane of a neuron.
- Explain the resting membrane potential, depolarization and hyperpolarization.
- Compare and contrast graded potentials and action potentials.
- Identify the four classes of neurotransmitters and give examples of their actions.
- Describe the general anatomic features of the brain.
- Compare and contrast the distribution of gray and white matter throughout the brain divisions.
- Describe the meninges, ventricles, cerebral spinal fluid composition, formation and circulation, and the blood-brain barrier.
- Describe the functional areas of the cerebrum.
- Describe the components of the diencephalon and the functions of the cerebellum.
- Identify the five anatomic subdivisions of the spinal cord.
- Describe the regions of gray and white matter of the spinal cord and the spinal cord meninges.
- Name the components of a sensory and motor conduction pathway.
- List the structures involved a reflex arc and the steps in its action.
- Describe the general function of sensory receptors.
- Describe the structures and function of the components of the eye and phototransduction.

Attendance:

Attendance is mandatory for all 1000/2000 level classes. You will not receive extra points for attendance. However, please see the grading rubric for the benefit of excellent attendance. There are no make-ups for exams. If an emergency forces you to miss an exam, then you may be allowed a make-up exam only with a valid and documented excuse, i.e. a written note from a physician or nurse at the University Health Center stating:

1. the suspected nature of the illness
2. The suspected severity of the illness, i.e., that the illness could be severe enough to warrant missing class.

Academic Integrity:

Students are expected to conduct themselves according to the principles of academic integrity as defined in the statement on Academic Dishonesty in the UNO Student Code of Conduct. Any student or group found to have committed an act of academic dishonesty shall have their case turned over to the Office of Student Accountability and Advocacy for disciplinary action which may result in penalties as severe as indefinite suspension from the University. Academic dishonesty includes, but is not limited to: cheating, plagiarism, fabrication, or misrepresentation, and being an accessory to an act of academic dishonesty. The University of New Orleans Student Code of Conduct can be found at <http://www.uno.edu/studentaffairs/sadocuments/studentcodeofconduct.pdf> and should be consulted if there are any questions.

Please Note: I have ZERO tolerance for cheating during an exam. I will STRICTLY enforce the following rules:

- 1. I will give ONE warning for wandering eyes. It will sound like this: "Keep your eyes on your own exam". After that, I will take your exam and you will receive a zero.**
- 2. There will be NO cell phones in your lap, on your desk, in your pocket, or on the floor. Your cell phones are to be put on vibrate and put away in your purse or backpack. If I see a cell phone out during an exam, I will take your exam and you will receive a zero.**
- 3. Do not wear a hat during an exam.**
- 4. Do not be late for an exam. Once the first student has finished an exam and left the room, the door will be locked and no one will be allowed to take an exam after that time.**
- 5. Do not ask to leave once you have begun your exam. You make not take a restroom break during the exam so take care of business before you arrive.**

Students with Disabilities:

The Office of Disability Services (ODS), in conjunction with the Office of Academic Affairs' campus wide administrative policy regarding the accommodations of students with disabilities, has two primary objectives: 1) to ensure compliance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ADA) in regard to equal access for qualified students to academic programs; and 2) to uphold the academic integrity of UNO. When these two objectives are met, those students who qualify for services based on clear, comprehensive, and relevant documentation will receive those services or academic modifications for which they are legally entitled.

ODS is considered the University's designated office for determining eligibility for services, reviewing and maintaining documentation, and recommending appropriate accommodations. Students, however, do not have to register with ODS in order to advocate for disability related accommodations. For those instructors who have students with disabilities who choose not to register for services with ODS, and who request academic accommodations, ODS is available as a resource to verify eligibility and recommend appropriate accommodations.

Part of this policy regulates the accommodative testing services. These accommodations are made available in the ODS Accommodative Testing and Adaptive Technology Center (ATATC), located in the Library Room 120. The breakdown of responsibility for ensuring efficient and secure accommodative testing in the ATATC is as follows:

Registered ODS students should:

1. Request from ODS in writing Accommodation Agreements each semester.
2. Set up appointments to meet with each instructor each semester to discuss accommodations and complete agreements.
3. Ensure each party involved receives their copy of the Agreement.
4. Complete Student Section of the Accommodative Testing Form for each test.
5. Arrive promptly at the ATATC and follow test proctor's instructions.

Classroom Etiquette:

1. Please refrain from using your cell phone during class.
2. Please avoid any disruptive behavior.
3. Hostile, harassing and non-inclusive language will not be tolerated. If any of these violations are severe enough, the student and the case can be referred to the Office of Student Accountability and Advocacy, and have possible judiciary consequences.

Once again the University of New Orleans Student code of conduct outlines this process and should be referred to if there are questions. The University of New Orleans Student Code of Conduct can be found at <http://www.uno.edu/studentaffairs/sa-documents/studentcodeofconduct.pdf>.

Conflict Resolution

All conflicts must be resolved in a civil, meaningful manner. Whether the conflict is between students or between student and an instructor, the conflict should be resolved in a private, yet safe environment. If a conflict between students cannot be resolved by the parties alone, then the instructor should step in or be consulted, to either resolve the conflict or direct it to the appropriate resources. If the conflict is between instructor and student, and the conflict cannot be resolved privately, additional consultation may be needed from the chair of the Biological Department, Dr. Wendy Schluchter. Dr. Schluchter can be contacted via email at wsluch@uno.edu.

Student Responsibility

It is the responsibility of the student to come prepared for lecture. The student will have already read the appropriate section of the text that corresponds to the lecture topic of the day. Students will arrive to class in a timely manner and display conduct that shows respect for the instructor as well as the other classmates.

"Who you are tomorrow begins with what you do today." Tim Fargo

Instructor Responsibility

As instructors at the University of New Orleans, it is our responsibility to provide students with the best education possible. It is the instructor's responsibility to ensure that each student has an equal opportunity to learn in a safe educational background. As instructors we will arrive to class on time, we will be prompt with grading and returning exams. Every instructor will keep at least 4 hours per week set aside for students to seek additional help or instruction. It is the responsibility of the instructor to answer a student's question to the best of their ability or be able to direct the student to that appropriate resource to answer the question. Instructors will not show bias to any student with regards to gender, race, nationality, sexual orientation/identification or age. All students will be treated fairly and equally.

Exams & Bonus Points

Exams:

There will be five (5) exams in the class. Each exam is worth 100 points and will consist of a combination of multiple choice, matching, true/false and short answer types of questions. You will need a GREEN scantron and a number 2 pencil for all exams. You will have one complete class period to finish your exam (50 minutes). Note: Because there is an optional final exam, one exam grade will be dropped. This means that if you are happy with your grade after exam 4, then you do not have to take the final exam. So, the final exam is your dropped grade. On the other hand, if you are NOT happy with your grade after exam four, you can take the final exam in hopes of boosting your grade. I will drop the lowest exam grade of the five. Taking the final cannot hurt your grade. Please see under academic integrity my rules for taking exams. I will adhere strictly to these rules.

Final Exam:

There is an OPTIONAL final exam. The final exam is cumulative and will be multiple choice questions only. Note the date is Wednesday, Dec 9 at 10:00 in the same room that we meet all semester. While there is a two hour time slot for this exam, you are not allowed a leisure arrival time. The exam begins at 10:00 sharp. DO NOT BE LATE! You will not be allowed to take the exam if any student has already completed his/her exam and left the room. NO EXCEPTIONS!

Exam Keys:

I will return your exam scantron in a timely manner. If you would like a copy of the written portion of the exam, you may come to my office and retrieve one. Please note, however, you will only be allowed to retrieve the exam copy up until the date of the next exam. For instance, if you wish to have a copy of exam one, then you have until the date of exam 2 to pick up the copy. After exam two is administered, exam one is no longer available to you. This is to prevent students bombarding me at the end of the semester (a very busy time for me) with requests for all of the copies of exams. The exam keys will be posted on my door. Please do not take this key farther than the table outside of my office. The keys are for ALL students to use so please keep it available for ALL students to use.

Bonus Points:

There may be occasional worksheets handed out in class that will be worth bonus points. You must be present in class to earn the bonus points.

Mastering Biology Homework Assignments:

There will be a total of 12 Online Homework Assignments that must be completed through Mastering A & P. There are due dates associated with each assignment so pay close attention to those dates through the website as there will be a 10% reduction in points for each day past the due date. There are a total of 505 points that can be earned through Homework Assignments.

Grading Rubric

<u>Final Grade</u>

There are a total of 1005 points for the class.

89.45 - 100% is an A and corresponds to exception effort.

79.45 - 89.44 is a B and corresponds to above average effort.

69.45 - 79.44 is a C and corresponds to average effort.

59.45 - 69.44 is a D and corresponds to below average effort.

Anything below a 59.44% is a F, which corresponds to an inadequate amount of effort.

To determine the amount of points needed to "get an A or a B or to pass this class", simply multiply the total points possible (1005) by the percentage you are trying to determine. For example, if you are trying to determine if you can get an A in the class, multiply 1005 by 89.45%. This equals 899. If after four exams, and 10 homework assignments your total points is 680, then you need (899 - 680) 219 points between exam 4 and the last two assignments to get an A.

If you have less than three absences for the semester, then the grading rubric is as follows:

88.45 - 100% A

78.45 - 88.44% B

68.45 - 78.44% C

58.45 - 68.44% D

58.44 and below F

Any exam grade that you see posted on Moodle already includes any bonus points you may have earned.

Study Guide

I will not hand out a formal study guide. Use the following the Learning Objectives handout posted on Moodle as your guide to determine what material you must understand for each exam. If it is on the Learning Objective handout, it is fair game for the exam.

In addition, I STRONGLY recommend doing the Homework Assignments as many times as possible as a study method. The first time you do the Homework Assignment you will receive a grade. After that you may do the Assignment as many times as you would like without harming your initial grade earned on the assignment. In that way, you may use them as a study guide.

Office Hours:

I am available to answer questions during my office hours. This time is set aside specifically for student support and should be utilized.

Appointment Hours:

If you are having difficulty coordinating your schedule with my office hours, then a specific appointment can be made. An email is the best way to schedule an appointment.

Science Tutoring Center:

Science building room 207 is the home of the Science tutoring center. There is no specific A&P program, but there are graduate and undergraduate students who facilitate the center and may be of assistance if other avenues are exhausted.

Note: Segments of this syllabus have been adopted from the syllabi of other faculty and it is subject for revision upon the instructor's need.

Date	Learning Objectives	Module	Page #
19-Aug	1. Describe a person in anatomic position	1.3	12
	2. List and define the major directional terms used in anatomy		
	3. Describe the locations of body structures using appropriate directional terminology		
	4. List and describe the locations of the major anatomical regions of the body		
	5. Describe the locations of body structures using regional terminology		
	6. Identify the various planes in which a body or body part might be dissected, and describe the appearance of a body presented along each of those planes		
21-Aug	1. Describe the location of the body cavities, and identify the major organs found in each cavity	1.4	16
	2. Describe the location of the four quadrants and nine regions		
	3. List and describe the serous membranes that line the body cavities		
	1. Describe the principle of homeostasis	1.5	21
	2. Describe the components of a feedback loop, and explain the function of each component		
	3. Compare and contrast negative and positive feedback in terms of the relationship between stimulus and response, and explain why negative feedback is the most commonly used mechanism to maintain homeostasis in the body		
	4. Describe how structure and function are related		
	5. Define the term gradient, and give examples of the types of gradients that drive processes in the body		
	6. Describe how cells communicate with one another, and state why such communication is necessary in a multicellular organism		
24-Aug	1. Distinguish between the terms solution, solute, solvent, colloid and suspension	2.2	34
	2. Explain why certain compounds will dissolve in water, whereas others will not		
	4. Explain what the pH scale measures, and state acidic, neutral and basic pH values	2.4	45
	5. Explain the function of a buffer		
	6. Define and describe the terms salt and electrolyte, and give examples of their physiological roles		
	2. Describe the location and components of intracellular and extracellular fluid		
3. Explain how cytoplasm and cytosol are different	3.1	68	
1. Describe how lipids are distributed in a cell membrane, and explain their functions			
2. Describe how carbohydrates and proteins are distributed in a cell membrane, and explain their functions			
3. Explain the overall structure of the plasma membrane according to the fluid mosaic model	3.2	70	
1. For osmosis and the different types of diffusion, describe the mechanism by which movement occurs, the energy requirements and the types of molecules that move			
2. Compare and contrast the effects of hypertonic, isotonic, and hypotonic condition on cells			
3. For primary and secondary active transport, describe the mechanism by which movement occurs, the energy requirements, the sources of energy, and the types of molecules moved			
26-Aug	4. For each type of vesicular transport, describe the mechanism by which movement occurs, the energy requirements, and the types of molecules moved	3.3	74
28-Aug	3. Compare and contrast the general features of the four major tissue types	4.1	124
	4. Describe the components of the extracellular matrix		

	5. Describe the types of junctions that unite in a tissue		
	1. Classify and identify the different types of epithelial tissues based on distinguishing structural characteristics	4.2	127
	2. Describe where in the body each type of epithelial tissue can be found		
	3. Describe the function of each type of epithelial tissue and correlate that function with structure		
31-Aug	4. Describe and classify the structural and functional properties of exocrine and endocrine glands		
	1. Compare and contrast the roles of individual cells and fiber types within connective	4.3	137
	2. Identify the different types of connective tissue, and classify them based on their distinguishing structural characteristics		
	3. Describe where in the body each type of connective tissue is found		
	4. Describe the functions of each type of connective tissue, and correlate function with structure for each tissue type		
2-Sep	1. Describe the general structure and function of membranes	4.7	152
	2. Explain the properties and locations of serous, synovial, mucous and cutaneous membranes		
	1. Describe how injuries affect epithelial, connective, muscular and nervous tissues	4.8	154
	2. Describe the process of regeneration		
	3. Explain the process of fibrosis		
4-Sep	Exam 1		
7-Sep	Labor Day		
9-Sep	1. Describe the basic function of the skin	5.1	160
	2. Describe the basic functions carried out by the components of the integumentary system		
	1. Explain how the cells of the epidermis are arranged into layers		
	2. Describe the cells of the epidermis and the life cycle of a keratinocyte		
	3. Describe how thick and thin skin differ		
	1. Describe the layers and basic structure and components of the dermis	5.3	168
	2. Explain the functions of the dermal papillae		
	3. Explain how skin markings such as epidermal ridges are formed		
	1. Explain how melanin is produced and its role in the integument	5.4	171
	2. Describe the other pigments that contribute to skin color		
	3. Explain how skin coloration may indicate pathology		
11-Sep	1. Describe the structure and function of hair and nails	5.5	173
	2. Explain the process by which hair and nails grow		
	3. Summarize the structural properties of sweat and sebaceous glands		
	4. Explain the composition and function of sweat and sebum		
	1. Explain how to classify burns and how to estimate their severity	5.6	177
	2. Describe the three types of cancerous skin tumors		
14-Sep	1. Describe the functions of the skeletal system	6.1	183
	3. Describe the gross structure of a long bone		
	1. Describe the inorganic and organic components of the extracellular matrix of bone	6.2	188
	2. Explain the functions of the three main cell types in bone tissue		
	3. Describe the microscopic structure of compact bone and the components of the osteon		
	4. Describe the microscopic structure of spongy bone		

16-Sep	1. Explain the differences between primary and secondary bone	6.3	193
	2. Describe the process of intramembranous ossification		
	3. Describe the process of endochondral ossification		
	10.1.2 Describe the five characteristics of skeletal muscle tissue.		
18-Sep	1. Describe how long bones grow in length		
	2. Compare longitudinal and appositional bone growth		
	3. Describe the hormones that play a role in bone growth		
	1. Describe the process of bone resorption and bone deposition	6.5	201
	2. Describe the physical, hormonal and dietary factors that influence bone remodeling		
	3. Explain the role of calcitonin, parathyroid hormone and vitamin D in bone remodeling and calcium ion homeostasis		
21-Sep	4. Describe the general process of bone repair		
	1. Describe the functional classification of joints based on degree of movement		
	2. Describe the structural classification of joints based on their anatomical features		
	3. Explain how the functional and structural classifications are related		
	1. Describe and demonstrate the generalized movements of synovial joints	8.5	264
23-Sep	1. Explain how the name of a muscle can help identify its action, appearance or location	9.1	283
	2. Summarize the major functions of skeletal muscles		
	3. Define the terms agonist, antagonist, synergist and fixator		
	4. For a given movement, differentiate specific muscles that function as agonist, antagonist, synergist or fixator		
	5. Differentiate among the three classes of levers in terms of relative position of fulcrum, force and load, as well as the relative power and range of motion		
	6. Give examples in the human body of muscles and their associated joints that illustrate each type of lever system		
25-Sep	Exam 2		
28-Sep	1. Describe the major functions of muscle tissue	10.1	339
	2. List and describe the structural elements and properties common to all types of muscle cells		
	3. Compare and contrast the characteristics of skeletal, cardiac and smooth muscle tissue		
	1. Describe the structural properties and components of a skeletal muscle fiber	10.2	342
	2. Explain the organization of a myofibril		
	3. Describe the structure and components of thick, thin and elastic filaments		
	4. Name and describe the function of each of the contractile, regulatory and structural protein components of a sarcomere		
30-Sep	5. Explain the sliding-filament mechanism of muscle contraction		
	1. Contrast the relative concentrations of sodium and potassium ions inside and outside the cell	10.3	348
	2. Differentiate between a concentration gradient and an electrical potential		
	3. Describe the role of the Na ⁺ /K ⁺ ATPase in maintaining the resting membrane potential		
	4. Describe the sequence of events of a skeletal muscle fiber action potential		
2-Oct	1. Describe the anatomy of the neuromuscular junction	10.4	352
	2. Describe the events at the NMJ that elicit an action potential in the muscle fiber		
	3. Explain excitation-contraction coupling		

	4. Describe the sequence of events involved in the contraction cycle of a skeletal muscle fiber		
	12.8.6 Graph and explain the electrical changes that occur in an axon.		
	5. Explain the process of skeletal muscle fiber relaxation		
5-Oct	1. Describe the immediate energy sources available to muscle fibers	10.5	361
	2. Describe the glycolytic and oxidative mechanisms that muscle fibers use to obtain ATP for muscle contraction		
	3. Explain the duration of activity that each ATP source can fuel		
	1. Describe the stages of a twitch contraction and explain how a twitch is affected by the frequency of stimulation.	10.6	363
	2. Relate tension production to the length of a sarcomere		
	3. Compare and contrast the anatomical and metabolic characteristics of type I and type II muscle fibers		
	1. Describe the structure and function of a motor unit	10.7	368
	2. Explain how muscle tone is produced		
	3. Compare and contrast the three types of contractions		
12-Oct	Exam 3		
14-Oct	3. Explain the major differences between the two functional divisions of the peripheral nervous system	11.1	382
	1. Describe the structure and function of each component of the neuron	11.2	384
	2. Describe the structure and function of each type of neuron		
	4. Describe the structure and function of the four types of CNS neuroglial cells and the two types of PNS neuroglial cells		
16-Oct	Mid-Semester Break		
19-Oct	1. Explain how ion channels cause development of the resting membrane potential	11.3	393
	2. Describe the voltage-gated ion channels that are essential for the development of an action potential		
	3. Interpret a graph showing the voltage-versus-time relationship of an action potential, and relate the terms depolarize, repolarize, and hyperpolarize to the events of an action potential		
	4. Explain the physiological basis of the absolute and relative refractory periods		
	5. Compare and contrast continuous and saltatory conduction		
	6. Explain how axon diameter and myelination affect conduction velocity		
21-Oct	1. Compare and contrast electrical and chemical synapses	11.4	406
	2. List the structures that make up a chemical synapse		
	3. Discuss the relationship between a neurotransmitter and its receptor		
	4. Describe the events of chemical synaptic transmission in chronological order		
	5. Define EPSP and IPSP and interpret graphs showing voltage-versus-time relationship of each		
	6. Explain temporal and spatial summation of synaptic potentials		
23-Oct	1. Explain how a single neurotransmitter may be excitatory at one synapse and inhibitory at another	11.5	413
	2. Describe the structural and functional properties of the major classes of neurotransmitters		
	3. Describe the most common excitatory and inhibitory neurotransmitters in the CNS		
	1. Define a neuronal pool and explain its purpose	11.6	417
	2. Compare and contrast the two main types of neural circuits in the CNS		
26-Oct	1. Describe the structure and function of each major region of the brain	12.1	425

	1. Describe and identify the five lobes of the cerebral cortex and explain how motor and sensory functions are distributed among the lobes	12.2	428
	2. Describe the structure, components and general functions of the regions of the diencephalon, cerebellum and brainstem		
	3. Describe the location and functions of the limbic system and reticular formation		
28-Oct	1. Describe the functions of the CSF as well as details of its production, its circulation and reabsorption into the bloodstream	12.3	443
	2. Describe the structural basis for and the importance of the BBB		
	3. Identify and describe the cranial meninges and explain their functional relationship to the brain		
30-Oct	1. Describe the gross anatomy and location of the spinal cord	12.4	448
	2. Identify and describe the anatomical features seen in a cross-sectional view of the spinal cord		
	3. Identify and describe the spinal meninges and the spaces between and around them		
	4. Describe the differences between ascending and descending tracts in the spinal cord		
2-Nov	Exam 4		
4-Nov	1. Describe the roles of the CNS and PNS in processing sensory stimuli	12.5	453
	2. Describe the locations and functions of first-, second-, and third-order neurons in a sensory pathway		
	3. Explain the ways in which special sensory stimuli are processed by the CNS		
6-Nov	1. Describe the locations and functions of the upper and lower motor neurons in a motor pathway	12.6	457
	2. Explain the roles of the cerebral cortex, basal nuclei, and cerebellum in movement		
	3. Describe the overall pathway from the decision to move to the execution and monitoring of a motor program		
	4. Explain how decussation occurs in sensory and motor pathways, and predict how brain and SC injuries affect these pathways		
9-Nov	1. Describe the differences between the endocrine and nervous systems in terms of the maintenance of homeostasis	12.7	463
	2. Provide specific examples demonstrating how the nervous system responds to maintain homeostasis		
	1. Describe the areas of the cortex responsible for cognition and language	12.8	467
	2. Discuss the concept of cerebral hemispheric specialization		
	3. Describe the parts of the brain involved in storage of long-term memory, and discuss possible mechanisms of memory consolidation		
11-Nov	1. Explain the differences between the sensory and motor divisions of the PNS	13.1	477
	2. Differentiate between somatic motor and visceral motor divisions of the nervous system		
	3. Describe the structure of a peripheral nerve and explain the differences between spinal nerves and cranial nerves		
	1. Identify the cranial nerves by name and number	13.2	481
	2. Classify each pair as sensory, motor or mixed nerve		
	3. Describe the location of selected cranial nerve nuclei and the ganglia associated with the cranial nerves		
13-Nov	1. Discuss the relationships between the structures of the spinal nerves: root, nerve, ramus, plexus, tract and ganglion	13.3	490

	2. Describe the gross anatomy of the spinal nerves		
	3. Identify and describe the four spinal nerve plexuses		
16-Nov	1. Describe the structure and function of a sensory neuron	13.4	499
	2. Define and describe exteroceptors, interoceptors and proprioceptors in terms of the general location of each in the body and the origin of stimulus each receives		
	3. Describe each of the following: nociceptors, thermoreceptors, mechanoreceptors, chemoreceptors and photoreceptors		
	4. Explain how sensory transduction takes place at a sensory receptor		
	5. Compare and contrast receptors for the general senses with receptors for special senses		
	6. Describe the pathway that a sensation takes from its detection in the PNS to its delivery in the CNS		
18-Nov	1. Describe the differences between upper motor neurons and lower motor neurons	13.5	506
	2. Describe the overall big picture view of how movement occurs		
	1. Describe reflex responses in terms of the major structural and functional components of a reflex arc	13.6	508
	2. Distinguish between each of the following pairs of reflexes: somatic versus visceral reflexes and monosynaptic and polysynaptic reflexes		
	3. Describe a simple stretch reflex, a flexion reflex and a crossed-extension reflex		
	4. Describe the role of stretch receptors in skeletal muscles		
20-Nov	Describe the similarities between the general senses and special senses	15.1	537
	2. Contrast the general senses with the special senses		
	1. Describe and identify the location of the olfactory receptors	15.2	538
	2. Explain how odorants activate olfactory receptors		
	3. Describe the path of action potentials from the olfactory receptors to various parts of the brain		
	1. Describe the location and structure of taste buds	15.3	542
	2. Explain how chemicals dissolved in saliva activate gustatory receptors		
	3. Trace the paths of nerve impulses from the gustatory receptors to various parts of the brain		
	4. Summarize the five primary taste sensations		
23-Nov	2. Describe the innervation and actions of the extrinsic eye muscles	15.4	546
	3. Identify the three layers of the eyeball		
	4. Describe the structure of the retina		
	1. Describe how light activates photoreceptors	15.5	552
	2. Explain how the optical system creates an image on the retina		
	3. Compare the functions of rods and cones in vision		
	4. Trace the path of light as it passes through the eye to the retina and the path of nerve impulses from the retina to various parts of the brain		
25-Nov	5. Explain the processes of light and dark adaptation		
	1. Describe how the structures of the outer, middle and inner ear function in hearing	15.7	568
	2. Trace the path of sound conduction from the auricle to the fluids of the inner ear		
	3. Trace the path of nerve impulses from the spiral organ to various parts of the brain		
	4. Explain how the structures of the ear enable differentiation of the pitch and loudness of sounds		
27-Nov	Thanksgiving Break		
30-Nov	1. Distinguish between static and dynamic equilibrium	15.8	575

	2. Describe the structure of the maculae and explain their function in static equilibrium		
	3. Describe the structure of the crista ampullaris and explain its function in dynamic equilibrium		
	1. Summarize the pathways for each of the special senses	15.9	579
	2. Describe how the frontal lobe and limbic system integrate the signal from the special senses into a meaningful picture of a situation		
2-Dec	Review		
4-Dec	Exam 5		