



Biology 200B – Human Anatomy & Physiology II

Spring Quarter 2012 Syllabus

General Course Information

Instructor/Course Coordinator/Lab Coordinator

Mr. Robert L Stewart Jr. – Part-time Faculty, Department of Biological Sciences

Email Address: rlstewart10@gmail.com (new email address)

Office: ASCB 365

Office Hours/Open Lab: Tuesday & Thursday 7:15pm-10pm; Friday 9am-12pm

Lab Instructors: Mr. Andre Baghoomian; Dr. Anahid Mirzaton; Mr. Behnam Radi; Mr. Robert L Stewart Jr

Please see your lab instructors for their contact information and/or office hours

Do not contact me for lab instructor contact information, get this settled day one of lab.

Course Description and Meeting Times

This course provides an introduction to human anatomy and physiology for non-science majors. The general objectives of the course are to gain a detailed understanding of the structure and function of the human body; to appreciate the relationship between structure and function; and to understand how various cells, tissues, organs and organ systems work together to maintain homeostasis. To achieve these general objectives, we will study the structure and function of the human body from a systems viewpoint.

The entire Biology 200 course is presented in two quarters. This quarter, we will cover the nervous system, the endocrine system, the reproductive system (including gametogenesis and development), the cardiovascular system (some lymphatic system included) and the respiratory system.

Meeting Times: Lecture - Monday, Wednesday and Friday 8:00am-8:50am, ASCB 132 Lecture Hall
Laboratory – M/W or T/Th in room ASCB 365

Course Website

Mastering A & P – Will contain syllabus, lecture slides (not lecture notes), mandatory lab and lecture quizzes, your progress, and anything else the teaching staff deems relevant to your successful completion of the course.

Also, use Mastering A & P to take advantage of the many online resources that the website/program offers. The resources are great and very helpful. You can find all sorts of activities to help you in this course in addition to pictures of tissues, models, dissection specimens, quizzes, practice lab exams, games, ect.

Also take advantage of the many online resources that the textbooks offer. They are great and very helpful. You can find all sorts of activities to help you in this course in addition to pictures of tissues, models, dissection specimens, quizzes, practice lab exams, games, ect.

Prerequisite: Biology 200A; I will drop anyone who does not have this prerequisite; no exceptions.

Suggested Textbooks

Lecture: Human Anatomy & Physiology: 8th Edition; E.N. Marieb and K. Hoehn; Benjamin Cummings/Pearson Higher Education 2010.

Required Textbooks

Laboratory: Integrate: The Pearson Custom Library for Anatomy & Physiology/ (9th) Custom Edition for California State University Los Angeles; E.N. Marieb and S.J. Mitchell; Benjamin Cummings/Pearson Higher Education 2011. ***I suggest getting the Lab Manual (mandatory) which is bundled with the E-textbook and the Mastering A & P program (also mandatory). This is the best deal and can be found in the campus bookstores.***

IMPORTANT NOTICE!

Cell Phones (or other electronic devices) are **NOT ALLOWED** to make any sound that may disrupt the learning process. Therefore, please turn your cell phones (or other electronic devices) off or to silent mode prior to entering the classroom. There will be 5 points deducted from your total score whenever your cell phone disrupts the lecture or the laboratory sections of this course. If my phone goes off, then every student receives 5 points. Fair? I think so.

Course Requirements

Attendance

Lecture attendance is very important to the overall progress you can achieve in this course. While I cannot police attendance in such a large course, there are some privileges that come with regular attendance. Any extra credit assignments or in-class assignments (that will be worth points) can only be taken advantage of by the students in attendance on that day. There is no make-up for assignments given in class, no matter what the excuse. There may or may not be a prior announcement made. **All extra credit opportunities for the course will be given in lecture only, unless the lecturer decides different.**

Laboratory attendance is also very important to the level of success of this course. You must be enrolled in a lab session, where you will perform experiments, study and manipulate anatomical models and charts, study histological specimens, and view demonstrations relevant to the topics in the lecture material. **The laboratory section is NOT another lecture, it is designed for collaborative, exploratory, and inquiry based learning. Therefore, come to lab prepared to work (this implies that there is some learning that should be done prior to arriving at lab)!**

Grading

You will receive a single grade for the lecture and lab portions of the course. Letter grades will be determined based on the **(already curved)** grading scale below. You must have at least 662 points (50%) to pass the course. The plus/minus grading system will be used. **There will be NO makeup exams.** Missed exams with a justified, **written, valid and verifiable excuse** (ie, physician's note) will be prorated based on scores on other exams. The final lecture exam must be taken to receive a grade for the course.

Grading Scale

A = 1240 -1325	(94% - 100%)	C = 869-974	(66% - 73%)
A- = 1161-1239	(88% - 93%)	C- = 816-868	(62% - 65%)
B+ = 1134-1160	(86% - 87%)	D+ = 776-815	(59% - 61%)
B = 1041-1133	(79% - 85%)	D = 697-775	(53% - 58%)
B- = 1002-1040	(76% - 78%)	D- = 662-696	(50% - 52%)
C+ = 975-1001	(74% - 75%)	F = Below 662	(Below 50%)

Component	Points in Overall Grade	Worth	Comments
Lecture			People who attend lecture regularly (and who prepare for lecture) usually do well in this course.
Classroom Assessments	200	20pts each	(10) Lecture-based Timed Website quizzes
Midterm Exams	200	100pts each	(2) In class midterm exams; formats may be any or all of the following: multiple choice, short-answer, fill in the blanks, diagramming
Research Paper	50	50 pts	(1) Research Paper. Details will be posted on the websites.
Final Exam	200	200 pts	(1) In class final exam; format may be any or all of the following: multiple choice, short-answer, fill in the blanks, diagramming.
Total Lecture Points	650		
Laboratory			Attendance in lab helps to grasp the lecture better. Students who take care of business while in lab usually do well in the course.
Mini-Practical Exams	150	50 pts each	(4) In lab mini-practical exams; lowest one will be dropped. 25 questions worth 2 points each.
Practical Exams	200	100 pts each	(2) In lab practical exams. 50 questions worth 2 points each.
Pre-lab quizzes	95	5 pts each	(19) pre-lab quizzes found in the lab manual before each exercise. Due at the beginning of the lab on the scheduled day for each exercise.
Online lab quizzes	115	5 pts each	(23) Timed Web Quizzes based on Review Exercises (5 pts each); Including Physioex Exercises
Physioex Lab Reports	40	10 points each	(4) Lab Reports generated from the 4 Physioex Exercises in Lab: 18B, 29B, 34B and 37B
Subjective evaluation	75	75 pts maximum	Each lab instructor can award these points on a case to case basis. Subjective points will reflect lab attendance, lab collaboration, lab preparedness, lab productivity, lab behavior (including whether you put things back how you found them, cleaning your area prior to leaving lab, level of respect for others, how long you stay in lab, plagiarism, following lab rules, etc).
Total Lab Points	675		
Total	1325 points		Percentage of total points determines the course grade

Late Assignments

Late assignments will have 10% of total possible points deducted for each day late.

Academic Honesty

Students are expected to abide by the University's Academic Honesty Policy, which can be found at http://www.calstatela.edu/univ/stuaffrs/Academic_Honesty.htm. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation. **I HIGHLY SUGGEST THAT YOU GO TO THIS SITE AND FIND OUT WHAT SORTS OF ACTIVITIES CAN GET YOU INTO HOT WATER AS FAR AS ACADEMIC HONESTY GOES.**

Tape Recorders and Laptops in Lecture

You may bring tape recorders to record the lectures. You may also bring laptops to be used for purposes consistent with engaging yourself with the lecture. However, if it is ever determined that you are using your laptop to do other things such as instant messaging, internet chatting, ect., the class will lose this privilege.

Lecture Exam Procedure

All students are to wait outside on exam days. The teaching staff needs to come in and set up for the exam. When you are invited into the hall, you will leave your personal items either at the back of the lecture hall, or on the floor in front of the lecture hall. You may only sit in seats that contain an exam. The only items you can take to your seat are the materials needed and allowed to take the exam such as pencils, pens, erasers, **scantrons**, etc. **If you are seated next to someone with the same version of the exam as yours, raise your hand and alert the instructors so that it may be exchanged (prior to beginning the exam). No electronic devices of any kind are allowed to be on your person on exam days (ipods, cell phones, mp3 players, laptops, ect)**

Lecture Schedule

Date	Topic	Reading
Apr 02	Course Introduction	Attendance is MANDATORY
Apr 04	Nervous Function and Histology	pp. 386; 388-395
Apr 06	Organization, Development, Protection	pp. 386-387; 429-433; 460-464
Apr 09	Physiology of Neurons	pp. 395-406
Apr 11	Synapses	pp. 406-421
Apr 13	Reflex Arcs; The Brain	pp. 514-519; 433-454
Apr 16	The Brain cont.	pp 433-454
Apr 18	The Spinal Cord and PNS	pp. 466-476; 491-511; 525-537; 542-543
Apr 20	General/Special Sense; Eye and Vision	pp. 485-488; 547-569
Apr 23	Eye and Vision cont.	pp. 547-569
Apr 25	MIDTERM EXAM I: 100 pts	
Apr 27	Taste and Smell; Hearing and Balance	pp. 569-573; 574-587
Apr 30	Taste and Smell; Hearing and Balance cont.	pp. 569-573; 574-587
May 02	Endocrine System I	pp. 594-624; 628-629
May 04	Endocrine System II	pp. 594-624; 628-629
May 07	Reproductive System I	pp. 1024-1057;1064-1065
May 09	Reproductive System II	pp. 1024-1057;1064-1065
May 11	Blood	Chapter 17
May 14	Heart	pp. 661-684
May 16	Heart cont.	pp. 661-684
May 18	MIDTERM EXAM II: 100 pts	
May 21	Blood Vessels & Lymphatics	pp. 695-701; 721-747; 752-757;762-763
May 23	Blood Pressure/Flow; Capillary Exchange	pp. 703-706; 710-714; 717-720
May 25	Control of Circulation	pp. 684-687; 706-710; 714-717
May 28	Memorial Day Holiday	No Lecture
May 30	Respiratory Anatomy	pp. 805-819
Jun 01	Mechanics of Breathing	pp. 819-826
Jun 04	Gas Exchange; Oxygen & Carbon Dioxide	pp. 827-834
Jun 06	Gas Exchange; Oxygen & Carbon Dioxide	pp. 827-834
Jun 08	Control of Respiration	pp. 834-839; 844-845
June 11	FINAL EXAM 8:00am - 10:30am	Cumulative

ADA Statement

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.

Laboratory Schedule

Date	Topic	Exercises
Apr 02, 03	Histology of Nervous Tissue; Brain Anatomy	17 & 19
Apr 04, 05	Brain Anatomy; Cranial Nerves	19
Apr 09, 10	Spinal Cord, Spinal Nerves, ANS	21
Apr 11, 12	Mini-Practical #1 ; Human Reflexes	22
Apr 16, 17	Neurophysiology of Nerve Impulses; EEG	18A; 18B; 20
Apr 18, 19	General Sensation; Eye & Vision	23 & 24
Apr 23, 24	Hearing & Equilibrium; Taste & Smell	25 & 26
Apr 25, 26	Mini-Practical #2; Review for Midterm	
4/30, 5/01	Midterm Practical Exam	
May 02, 03	Endocrine System	27
May 07, 08	Reproductive Anatomy & Physiology	42 & 43
May 09, 10	Blood & Heart Anatomy	29A, 29B; & 30
May 14, 15	Mini-Practical #3 ; Heart Anatomy cont.	30
May 16, 17	Heart Anatomy & Blood Vessels	30 & 32
May 21, 22	Blood Vessels & Lymphatics (Immune)	32; pp. 525-529 (35A)
May 23, 24	Cardiovascular Physiology; ECG	31 & 33A; 34B
May 28, 29	Memorial Day Holiday	No Lab
May 30, 31	Respiratory Anatomy	36
June 04, 05	Mini-Practical #4 Respiratory Mechanics	37A & 37B
June 06, 07	Final Practical Exam	

MP 1 will cover the period from April 02 – April 10

MP 2 will cover the period from April 11 – April 24

Midterm Practical will cover the period from April 02 – April 26

MP 3 will cover the period from May 02 - Blood

MP 4 will cover the period from Heart Anatomy – May 31

Final Practical will cover the period from May 02 – June 05

All assigned Physioex exercises are to be completed by the student on a computer away from the laboratory (home or school computers). Physioex exercises will be included on the online lab quizzes, and will be covered on lab exams.

Open Lab - We will open an additional lab as much as we can to allow students to **study**. Open lab is for you to increase your chances of getting the grade you want out of this course. There will be no extra credit given for your taking advantage of open lab opportunities. Remember, the teaching staff is opening the additional lab voluntarily (**no extra pay**). Furthermore, open lab is not merely another taught lab that you can attend in lieu of your assigned lab. **The teaching staff is there to supervise, not to teach. Please use “office hours” or your assigned lab period to discuss anything you are not understanding with your own lab instructor.**

Laboratory Safety and Rules

- Evacuation Procedures (Follow directions of your instructor)
- Hazardous Materials – be careful when handling glass and sharp objects such as microscope slides, test tubes, and dissecting tools. Report any injury, spill or broken equipment to your instructor.
- No eating or drinking in the lab. Do not even bring food into the lab unless it is secure within your backpack or other closed carrying apparatus. Bottled water is acceptable.
- Be careful with all lab equipment. Follow any instructions on how to operate any equipment in the lab. Be careful not to write on any charts, models, lab benches, ect. Make sure to handle models, bones, skeletons, ect with extreme care as they are very expensive.
- Make sure to leave the lab as you found it when you arrived. Clean up after yourselves, put all models and keys back where you found them; reassembled and in order. Push your lab stools under the lab bench before you leave. Failure to do so will result in a deduction of subjective points.
- Lab coats are not required, but may be useful on days when performing dissections or other “wet lab” procedures. Lab coats will protect your clothing.
- **NO PHOTOGRAPHY** will be allowed in the laboratory. Your textbooks have excellent and adequate online resources for you in the form of pictures, models, histology slides, etc. It has not been seen in this course that taking pictures helps anyone’s grades. We are convinced of that.
- **CELL PHONES (and other electronic devices)** are not allowed to sit on the lab benches, are not allowed to be used in the laboratory, are not allowed to ring or make any other noise during the lab period. The penalty for cell phone (or other electronic device) disruption is a deduction of 5 points every time it happens. You may not plug your cell phones or other electronic devices into the laboratory electrical outlets (**Laptops excepted when being used as a laboratory learning tool**).
- You may bring a laptop in order to be used for educational purposes only. If you are caught using the laptop for anything not relevant to this course, you will lose your privilege to use it during your laboratory period.
- You must take your laboratory time seriously, therefore, no horseplay or unnecessarily loud conversations during lab. You may be affecting the concentration of your colleagues around you. However, collaboration, discussion and polite debate of the course subject matter are encouraged within groups (or even between groups).
- You will be given a copy of this contract to sign which says that you understand the laboratory rules for this course. You must sign this agreement in order to begin subjective evaluation.
- Failure to turn in assignments, unexcused tardiness, unexcused absences, lack of effort in lab will all result in a reduction of your subjective lab points.

Please sign below.

I understand and agree to follow all laboratory safety procedures and rules.

Name: _____ Date: _____

Lab Instructor’s Name: _____ Date: _____

Biology 200B Human Anatomy & Physiology II – Student Learning Objectives

Adopted from *Human Anatomy & Physiology: 8th Edition*; E.N. Marieb and K. Hoehn; Benjamin Cummings/Pearson Higher Education 2010

The Nervous System

By the end of the quarter term, students will be able to:

- ✗ List the basic functions of the nervous system
- ✗ Explain the structural and functional divisions of the nervous system
- ✗ List the types of neuroglia and cite their functions
- ✗ Define neuron, describe its important structural components, and relate each to a functional role
- ✗ Differentiate between a nerve and a tract, and between a nucleus and a ganglion.
- ✗ Explain the importance of the myelin sheath and describe how it is formed in the central and peripheral nervous systems.
- ✗ Classify neurons structurally and functionally.
- ✗ Describe the process of brain development
- ✗ Name the major regions of the adult brain
- ✗ Name and locate the ventricles of the brain
- ✗ Describe how meninges, cerebrospinal fluid, and the blood-brain barrier protect the central nervous system
- ✗ Describe the formation of cerebrospinal fluid, and follow its circulatory pathway
- ✗ Define resting membrane potential and describe its electrochemical basis
- ✗ Compare and contrast graded potentials and action potentials
- ✗ Explain how action potentials are generated and propagated along neurons
- ✗ Define absolute and relative refractory periods
- ✗ Define salutatory conduction and contrast it to conduction along unmyelinated fibers
- ✗ Define synapse
- ✗ Distinguish between electrical and chemical synapses by structure and by the way they transmit information
- ✗ Distinguish between excitatory and inhibitory postsynaptic potentials
- ✗ Describe how synaptic events are integrated and modified
- ✗ Define neurotransmitter and name several classes of neurotransmitters
- ✗ Understand the general manner by which neurotransmitters affect targets
- ✗ Name and describe the components of a reflex arc and distinguish between autonomic and somatic reflexes
- ✗ Compare and contrast stretch, flexor, crossed-extensor, and Golgi tendon reflexes
- ✗ List the major lobes, fissures, and functional areas of the cerebral cortex
- ✗ Explain lateralization of hemisphere function
- ✗ Differentiate between commissures, association fibers, and projection fibers
- ✗ Describe the general function of the basal nuclei
- ✗ Describe the location of the diencephalon, and name its subdivisions and functions
- ✗ Identify the three major regions of the brain stem, and note the functions of each area
- ✗ Describe the structure and function of the cerebellum
- ✗ Locate the limbic system and the reticular formation, and explain the role of each functional system
- ✗ Define electroencephalogram (EEG) and distinguish between alpha, beta, theta, and delta brain waves
- ✗ Describe the gross and microscopic structure of the spinal cord
- ✗ List the major spinal cord tracts, and classify each as a motor or sensory tract
- ✗ Define ganglion and indicate the general body location of ganglia
- ✗ Describe the general structure of a nerve

- ✗ Name the 12 pairs of cranial nerves, state whether they are motor, sensory, or mixed, and indicate the body regions and structures innervated by each
- ✗ Describe the formation of a spinal nerve and the general distribution of its rami
- ✗ Define nerve plexus
- ✗ Name the major plexuses and describe the distribution and function of the major peripheral nerves arising from each plexus.
- ✗ Define a dermatome, and understand how dermatomes can be used to locate spinal cord damage
- ✗ Define autonomic nervous system and explain its relationship to the peripheral nervous system
- ✗ Compare the somatic and autonomic nervous systems relative to effectors, efferent pathways, and neurotransmitters released
- ✗ Compare and contrast the functions of the parasympathetic and sympathetic divisions
- ✗ Describe the site of CNS origin, locations of ganglia, and general fiber pathways for the parasympathetic and sympathetic divisions
- ✗ Define cholinergic and adrenergic fibers, and list the different types of their receptors
- ✗ State the effects of the parasympathetic and sympathetic divisions on several organs
- ✗ Describe autonomic nervous system controls.
- ✗ Classify general sensory receptors by structure, stimulus detected, and body location
- ✗ Identify the special senses
- ✗ Describe the structure and function of accessory eye structures, eye layer, the lens, and humors of the eye
- ✗ Trace the pathway of light through the eye to the retina, and explain how light is focused for distant and close vision
- ✗ Describe the events involved in the stimulation of photoreceptors by light, and compare and contrast the roles of rods and cones in vision
- ✗ Trace the visual pathway to the visual cortex
- ✗ Describe the structure and function of accessory eye structures, eye layers, the lens, and humors of the eye
- ✗ Trace the pathway of light through the eye to the retina, and explain how light is focused for distant and close vision
- ✗ Describe the events involved in the stimulation of photoreceptors by light, and compare and contrast the roles of rods and cones in vision.
- ✗ Trace the visual pathway to the visual cortex
- ✗ Describe the location, structure, and afferent pathways of taste and smell receptors, and explain how these receptors are activated
- ✗ Describe the structure and general function of the outer, middle, and internal ears.
- ✗ Describe the sound conduction pathway to the fluids of the internal ear, and follow the auditory pathway from the spiral organ (of Corti) to the temporal cortex
- ✗ Explain how one is able to differentiate pitch and loudness, and localize the source of sounds
- ✗ Explain how the balance organs of the semicircular canals and the vestibule help maintain dynamic and static equilibrium
- ✗ Understand the homeostatic interrelationships between the nervous system and other body systems

The Endocrine System

By the end of the quarter term, students will be able to:

- ✗ Indicate important differences between hormonal and neural controls of body functioning
- ✗ List the major endocrine organs, and describe their body locations
- ✗ Distinguish between hormones, paracrines, and autocrines
- ✗ Describe how hormones are classified chemically

- ✗ Describe the two major mechanisms by which hormones bring about their effects on their target tissues
- ✗ List three kinds of interaction of different hormones acting on the same target cell
- ✗ Explain how hormone release is regulated
- ✗ Describe structural and functional relationships between the hypothalamus and the pituitary gland
- ✗ List and describe the chief effects of anterior pituitary hormones
- ✗ Discuss the structure of the posterior pituitary, and describe the effects of the two hormones it releases
- ✗ Describe important effects and regulation of the two groups of hormones produced by the thyroid gland
- ✗ Understand the basics of thyroxine formation and release
- ✗ Understand the general functions and regulation of parathyroid hormone
- ✗ List hormones produced by the adrenal gland, and cite their physiological effects
- ✗ Describe the importance of melatonin in sleep-wake cycles
- ✗ Compare and contrast the effects of the two major pancreatic hormones
- ✗ Discuss the regulation of blood glucose levels
- ✗ Describe the functional roles of hormones of the testes, ovaries, and placenta
- ✗ Name a hormone produced by the heart
- ✗ Understand hormone secretion via organs outside of the endocrine system
- ✗ Understand the homeostatic interrelationships between the endocrine system and other body systems

The Reproductive System

By the end of the quarter term, students will be able to:

- ✗ Describe the structure and function of the testes, and explain the importance of their location in the scrotum
- ✗ Describe the location, structure and function of the accessory reproductive organs of the male
- ✗ Discuss the sources and function of semen
- ✗ Describe the phases of the male sexual response
- ✗ Discuss hormonal regulation of testicular function and the physiological effects of testosterone on male reproductive anatomy
- ✗ Describe the location, structure, and function of the ovaries
- ✗ Describe the location, structure, and function of each of the organs of the female reproductive duct system
- ✗ Describe the anatomy of the female external genitalia
- ✗ Discuss the structure and function of the mammary glands
- ✗ Describe the ovarian cycle phases, and relate them to events of oogenesis
- ✗ Describe the regulation of the ovarian and uterine cycles
- ✗ Discuss the physiological effects of estrogens and progesterone
- ✗ Define meiosis. Compare and contrast it to mitosis.
- ✗ Outline events of spermatogenesis
- ✗ Describe the process of oogenesis and compare it to spermatogenesis
- ✗ Understand the homeostatic interrelationships between the reproductive system and other body systems

The Cardiovascular System

By the end of the quarter term, students will be able to:

- ✗ Describe the composition and physical characteristics of whole blood.

- ✗ List eight functions of blood
- ✗ Discuss the composition and functions of plasma
- ✗ Describe the structure, function, and production of erythrocytes
- ✗ Describe the chemical makeup of hemoglobin
- ✗ List the classes, structural characteristics, and functions of leukocytes
- ✗ Describe how leukocytes are produced
- ✗ Describe the structure and function of platelets
- ✗ Describe the process of hemostasis
- ✗ List factors that limit blood clot formation and prevent undesirable clotting
- ✗ Describe the ABO and Rh blood groups.
- ✗ Explain the basis of blood transfusion reactions
- ✗ Describe the size, shape, location, and orientation of the heart in the thorax
- ✗ Name the coverings of the heart
- ✗ Describe the structure and function of each of the three layers of the heart wall
- ✗ Describe the structure and functions of the four heart chambers
- ✗ Name each heart chamber and provide the name and general route of its associated great blood vessel(s)
- ✗ Trace the pathway of blood through the heart
- ✗ Name the major branches and describe the distribution of the coronary arteries
- ✗ Name the heart valves and describe their location, function, and mechanism of operation
- ✗ Describe the structural and functional properties of cardiac muscle, and explain how it differs from skeletal muscle
- ✗ Describe the basic events of cardiac muscle cell contraction
- ✗ Name the components of the conduction system of the heart, and trace the conduction pathway
- ✗ Draw a diagram of a normal electrocardiogram (ECG) tracing
- ✗ Name the individual waves and intervals of an ECG and indicate what each represents
- ✗ Name some abnormalities that can be detected on an ECG tracing
- ✗ Describe normal heart sounds
- ✗ Describe the timing and events of the cardiac cycle
- ✗ Name and explain the effects of various factors regulating stroke volume and heart rate
- ✗ Explain the role of the autonomic nervous system in regulating cardiac output
- ✗ Describe the three layers that typically form the wall of a blood vessel, and state the function of each
- ✗ Define vasoconstriction and vasodilation
- ✗ Compare and contrast the structure and function of the three types of arteries
- ✗ Describe the structure and function of a capillary bed
- ✗ Describe the structure and function of veins, and explain how veins differ from arteries
- ✗ Define blood flow, blood pressure, and resistance, and explain the relationship between these factors
- ✗ List and explain the factors that influence blood pressure
- ✗ Describe how blood pressure is regulated
- ✗ Define hypertension, and describe its manifestations and consequences
- ✗ Explain how blood flow is regulated in the body in general
- ✗ Outline factors involved in capillary dynamics, and explain the significance of each
- ✗ Define circulatory shock
- ✗ Trace the pathway of blood through the pulmonary circuit, and state the importance of this special circulation
- ✗ Describe the general functions of the systemic circuit
- ✗ Name and give the location of the major arteries and veins in the systemic circulation
- ✗ Describe the structure and special function of the hepatic portal system
- ✗ Understand the homeostatic interrelationships between the cardiovascular system and other body systems

The Lymphatic System

By the end of the quarter term, students will be able to:

- ✗ List the functions of the lymphatic vessels
- ✗ Describe the structure and distribution of lymphatic vessels
- ✗ Describe the source of lymph and mechanism(s) of lymph transport
- ✗ Describe the basic structure and cellular population of lymphoid tissue
- ✗ Describe the general location, histological structure, and function of lymph nodes
- ✗ Understand the homeostatic interrelationships between the lymphatic system and other body systems

The Respiratory System

By the end of the quarter term, students will be able to:

- ✗ Identify the organs forming the respiratory passageway(s) in descending order until the alveoli are reached
- ✗ Describe the location, structure, and function of each of the following: nose, paranasal sinuses, pharynx, larynx, and trachea
- ✗ List and describe several protective mechanisms of the respiratory system
- ✗ Distinguish between conducting and respiratory zone structures
- ✗ Describe the makeup of the respiratory membrane, and relate structure to function
- ✗ Describe the gross structure of the lungs and pleurae
- ✗ Explain the functional importance of the partial vacuum that exists in the intrapleural space
- ✗ Relate Boyle's law to events of inspiration and expiration
- ✗ Explain the relative roles of the respiratory muscles and lung elasticity in producing the volume changes that cause air to flow into and out of the lungs
- ✗ List several factors that influence pulmonary ventilation
- ✗ Explain and compare the various lung volumes and capacities
- ✗ Define dead space
- ✗ Indicate types of information that can be gained from pulmonary function tests
- ✗ State Dalton's law of partial pressures and Henry's Law
- ✗ Describe how atmosphere and alveolar air differ in composition, and explain the differences
- ✗ Relate Dalton's and Henry's laws to events of external and internal respiration
- ✗ Describe how oxygen is transported in the blood, and explain how oxygen loading and unloading is affected by temperature, pH, BPG, and P_{CO_2}
- ✗ Describe carbon dioxide transport in the blood
- ✗ Describe the neural controls of respiration
- ✗ Compare and contrast the influences of arterial pH, arterial partial pressure of oxygen and carbon dioxide, lung reflexes, volition, and emotions on respiratory rate and depth
- ✗ Compare and contrast the hyperpnea of exercise with hyperventilation
- ✗ Understand the homeostatic interrelationships between the respiratory system and other body systems