

Mercer County Community College

Bio 104 Course Outline

Spring, 2008

Bio 104
Course Number

Anatomy & Physiology II
Course Title

Science & Health Professions
Division

4
Credits
Hours

3
Lecture Hours

3
Laboratory

Textbook: Hole's Human Anatomy and Physiology

Shier, Butler, Lewes
McGraw-Hill
11th edition, 2007

Lab Manual: Laboratory Investigations in Anatomy & Physiology
- Cat Version

Stephen N. Sarikas
Pearson/Benjamin-Cummings
1st edition, 2007

Catalog Description: Continuation of Bio 103 covering digestive, circulatory, urinary, reproductive, respiratory, and endocrine systems. Lab includes cat dissection, human anatomy study via computer software, and quantitative studies of physiological processes. Does not fulfill any requirements in the Biology AS degree.

Prerequisites: Bio 103 or MLT 112 or permission of coordinator.

Course Coordinator:

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General Objectives:

1. To understand the body's normal functioning by explaining the structures and functions of the cells, tissues, organs, and organ systems of the human body.
2. To integrate structure and function so that anatomy is never an end in itself but a prerequisite for the comprehension of physiology which is essential for understanding the human body.
3. To emphasize the importance of learning how the body functions in health before one can appreciate the many implications of disease.
4. To provide an understanding of the normal structure and function of the human body such that the student can develop habits of healthful living.

Attendance and Grading:

1. Attendance at lectures is expected. To be successful in this course you should plan to attend all lectures and laboratory sessions. If you miss a lecture or lab for any reason it is your responsibility to obtain the missed information including course material covered, any announcements made, and any handouts that may have been distributed in class.
2. **All lecture exams will be given in class or in the testing center (LA-216).** The tests covering the lecture material will be given periodically at the end of study of a unit or system. There will be four regular lecture exams plus one comprehensive final exam.
3. Testing Center Procedures:
You will need a valid Mercer County College ID in order to be admitted to the testing center. The course instructor will not be able to admit you. You will have approximately 4 to 5 days to take each lecture test. Plan to take each test early in the testing period in order to avoid long lines. You may only take each test once.
4. It is your responsibility to be present for all tests, lab practicals, and the final exam. **There are no make-up exams.** If you miss a lecture exam for any reason, your final exam grade will be counted twice. Additional missed lecture exams will be counted as a zero grade. Three unexcused lab sessions may result in an automatic F for the course no matter how high the lecture grade.

5. Grading: You may keep track of your scores on page 12 of this course outline.

A	93-100%	B+	87-89%	C+	77-79%	D	60-69%
A-	90-92	B	83-86	C	70-76	F	<60%
		B-	80-82				

6. Examination questions may be objective, (multiple choice, T-F, matching, or fill-in-the-blank) and/or short answer essay.
7. The final exam will be cumulative and will be given during the scheduled final period for the Spring, 2008 semester (May 13-17, 2008). **You must take the final exam in order to complete the course.**
8. **Academic Integrity Statement:** Any student who: a) knowingly represents the work of others as her/his own, b) uses or obtains unauthorized assistance in the execution of any academic work, or c) gives fraudulent assistance to another student is guilty of cheating. Violators will be penalized in accordance with established college policies.
9. **Classroom Conduct:** Students are expected to be on time for all classes. In addition, students are expected to follow ordinary rules of courtesy during class sessions. The use of buzzing and ringing communication and electronic devices and engaging in side conversations during class time are distracting to other students and the instructor. The instructor has the right to eject a disruptive student from the class at any time.

**THE COURSE INSTRUCTOR RESERVES THE RIGHT TO CHANGE
THE TEST SCHEDULE AND GRADING AT ANY TIME.**

Schedule of Lecture Topics and Laboratory Work

<u>Week</u>	<u>Subject</u>	<u>Text Chapters</u>	<u>Lab</u>
1	Digestive System	17, 18	Human Muscles [Ex.11] Dissection of Muscles: Cat [Dissection Ex. 2, p.551-570]
2	Digestive System	17, 18	Muscle dissection (con't.)
3	Digestive System	17, 18	Digestive system [Ex. 26] [Dissection Ex. 8, p. 613-622]
	→ Lecture TEST #1 (Digestive system)		
4	Cardiovascular System	14 - 16	Computer exercise: Muscles, Digestive system Review for L.P. #1

<u>Week</u>	<u>Subject</u>	<u>Text Chapters</u>	<u>Lab</u>
5	Cardiovascular System	14 - 16	Lab Practical #1
6	Cardiovascular System	14 - 16	Blood [Ex. 19] Computer exercise: CV system
	→ Lecture TEST #2 (CV system)		
7	Urinary System	20, 21	Heart Dissection [Ex. 20] Cat - Veins [Dissection Ex. 5, p. 587-600]
8	Urinary System	20, 21	Cat - Arteries [Dissection Ex. 5, p. 587-600]
	→ Lecture TEST #3(Urinary system)		
9	Reproductive System	22, 23	Computer exercise Review for L.P. #2
10	Reproductive System	22, 23	Lab Practical #2
11	Reproductive System	22, 23	Urinalysis [Ex. 29] Urinary system [Ex. 28] Reproductive system [Ex. 30, 31] [Dissection Ex. 9 & 10, p. 623 -636]
	→ Lecture TEST #4 (Reproductive system)		
12	Respiratory System	19	Respiratory system [Ex. 24, 25] [Dissection Ex.7, p. 607-612]
13	Respiratory System	19	Computer exercise: Urinary/Reproductive/ Resp. systems Review for L.P. #3
14	Respiratory System	19	Lab Practical #3
15	Endocrine System	13	
	→ Lecture TEST #5 (FINAL EXAM) - cumulative		

Laboratory Safety Instructions

Your laboratory instructor will call your attention to safety procedures to be followed in the Anatomy and Physiology laboratory. Be sure to become familiar with the location and use of the following safety equipment:

Eyewash	Soap and Running water
Fire blanket	Safety Glasses (or goggles)
Fire Extinguishers	Emergency electric power shut off

The following are procedures for the dissection of large specimens such as the cat:

1. Use the disinfectant solution on the lab work table.
2. Be certain to wear latex, plastic, or rubber gloves.
3. Be careful not to cut yourself or your partner with the dissecting instruments. Never cut toward yourself or your partner. Your lab instructor will demonstrate proper handling and use of the dissecting tools.
4. In the event of a cut or injury of any kind, you must notify your laboratory instructor immediately.
5. When finished the dissection, store your cats as directed and wash the dissecting surface with the disinfectant.
6. Be certain to wash your hands with soap and water prior to leaving the lab for any reason.

*****NO EATING OR DRINKING in the laboratory*****

For the dissection of small specimens such as kidneys, hearts, etc., follow the procedures above and place specimens in dissecting trays.

Although dangerous chemicals are used infrequently, always read labels and follow instructions carefully.

Before leaving the laboratory, make certain that the gas jets at your station are off and push your chair under the lab table.

Anatomy & Physiology Websites:

Bio 104 Website: <http://www.mccc.edu/~falkow> Contains the course outline, lecture outlines, and lab information.

Hole's website: <http://www.mhne.com/shier11> Companion website that accompanies the textbook.

http://www.mhhe.com/biosci/ap/cat_dissect/ Waters: Web-Based Cat Dissection Review for Human Anatomy and Physiology for \$18.00. The demo on muscles is free.

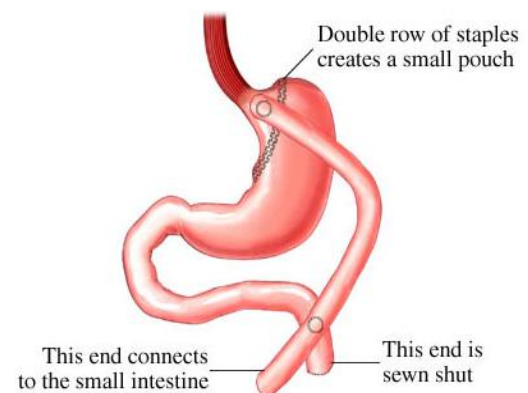
http://www.gen.umn.edu/faculty_staff/jensen/1135/webanatomy/ University of Minnesota Tutorials using photos and images in a multiple choice format. Includes medical terminology and most body systems.

<http://www.bio.psu.edu/faculty/strauss/anatomy> Penn State University Links to great photos of muscular, digestive, circulatory, and urogenital systems on the cat.

<http://www.anatomylab.com> Contains learning resources including practice lab practicals.

Course Objectives**Test #1: Digestive System**
[Chapters 17 & 18]

1. Identify the organs of the alimentary canal.
2. Explain the functions of the digestive system.
3. Name the 4 main histological layers of the alimentary canal and explain their functions.
4. Describe the movements of the alimentary canal.
5. Describe mechanisms that regulate activities of the digestive system.
6. Discuss the cavities and membranes associated with the digestive organs.
7. Describe the structures and the functions of the oral cavity, including the tongue, teeth, and salivary glands.
8. Describe the structure and function of the pharynx and esophagus.
9. Describe the anatomy and histology of the stomach and its role in digestion.
10. Describe the structure and functions of the pancreas.
11. Describe the structure and functions of the liver.
12. Describe the structure and functions of the gall bladder.
13. Describe the ducts of the pancreas, liver, and gall bladder.
14. Describe the anatomy and histology of the small intestine.
15. Explain the functions of the intestinal secretions.
16. Describe the anatomy and physiology of the large intestine.
17. Describe the hormonal regulation of digestive activities.
18. Discuss the digestion and absorption of carbohydrates, proteins, and lipids.
19. Explain the digestive system disorders as covered in class.
20. Discuss life-span changes that affect the digestive system.



Course Objectives**Test #2: Cardiovascular System**

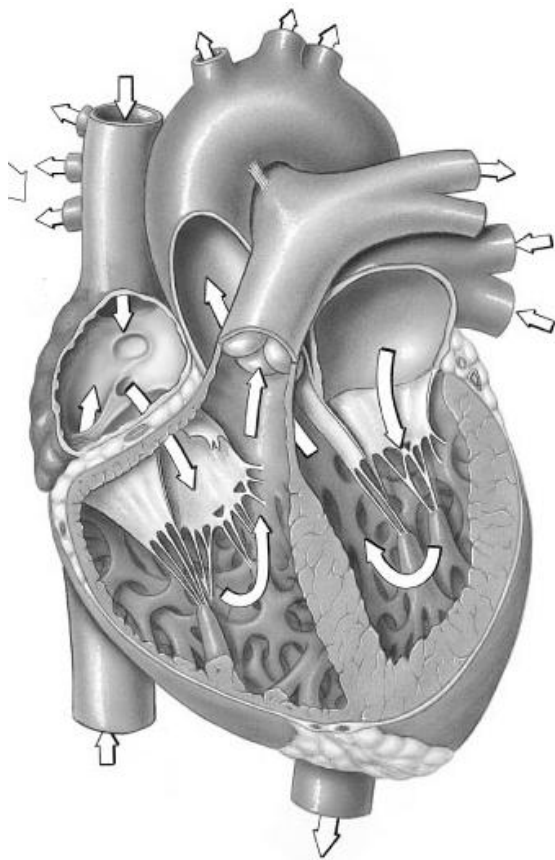
[Chapters 14, 15, 16]

1. Name the important components, major functions and characteristics of blood.
2. Discuss the characteristics and functions of erythrocytes including erythropoiesis.
3. Explain the classification and functions of leukocytes, including their formation.
4. Explain the characteristics, functions, and formation of thrombocytes.
5. Discuss the composition and functions of plasma.
6. Explain the mechanism of hemostasis including blood vessel spasm, platelet plug formation, and blood coagulation.
7. Describe the location and general characteristics of the heart.
8. Describe the structure and function of the pericardium.
9. Be able to trace the blood flow through the heart, naming vessels, chambers, and valves.
10. Identify the layers of the heart wall.
11. Name the major vessels of the coronary circulation and explain the nervous innervation of the heart.
12. Describe the conduction system of the heart.
13. Explain the electrical events associated with a normal ECG.
14. Explain the cardiac cycle (systole and diastole) and the 2 main heart sounds that occur in this cycle.
15. Define cardiac output, stroke volume, and heart rate and explain the factors that have an affect on these variables.
16. Describe the difference between the various blood vessels based on their structure and function.
17. Explain the different types of capillary exchange and the various pressures involved in the movement of substances between the capillaries and interstitial spaces.
18. Explain how central and local mechanisms regulate blood flow and pressure.
19. Explain neural mechanisms that regulate blood flow and BP including the CV center in the medulla, and reflex control through baroreceptors and chemoreceptors.

[FOR MORE CV SYSTEM OBJECTIVES.... TURN PAGE →]

Cardiovascular System Objectives - continued

20. Describe the differences between the pulmonary circulation and the systemic circulation.
21. Name (in sequence) the specific vessels of the pulmonary, systemic, & hepatic portal circulation.
22. List the main components and functions of the lymphatic system.
23. Explain the abnormal situations discussed in this unit such as pericarditis, MVP, HT, erythroblastosis fetalis, hemophilia, etc.

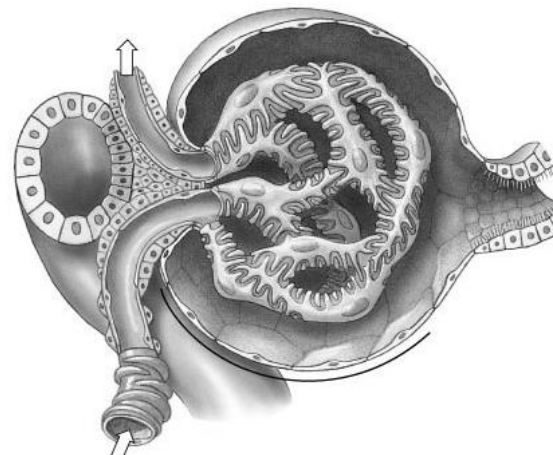


Course Objectives

Test #3: Urinary System

[Urinary system: Chapters 20 & 21]

1. Name the components of the urinary system.
2. Explain the functions of the urinary system.
3. Describe the gross anatomy of the kidney and other structural features of the kidney.
4. Describe the parts and functions of the nephron: renal corpuscle (Bowman's capsule and glomerular capillaries) and the tubules (pct, loop of Henle, dct).
5. Describe structure and function of the juxtaglomerular apparatus (JGA).
6. Name the 2 types of nephrons and describe their location.
7. Name the major blood vessels of the kidney and be able to trace the path of blood through the kidney.
8. Explain the distinctive features of the blood supply to the kidney.
9. Explain the processes of urine formation.
10. List and explain the various pressures that influence filtration.
11. Explain the GFR and the factors that influence the rate of filtrate formed.
12. List the substances that can pass through the filtration membrane.
13. Explain the process of reabsorption.
14. Explain the countercurrent mechanism as discussed in class.
15. Explain the process of secretion.
16. Explain the role of ADH and aldosterone in the regulation of urine volume and concentration.
17. Describe the composition and characteristics of urine.
18. Describe the structure and function of the ureters, urinary bladder, and urethra.
19. Discuss the micturition reflex.
20. Discuss body fluid composition (ICF vs ECF).
21. Explain water balance disorders (dehydration, water intoxication, and edema).
22. Explain the clinical situations as discussed in class.

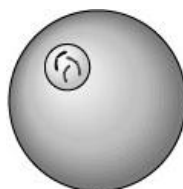


Course Objectives

Test #4: Reproductive System

[Reproductive system: Chapters 22 and 23]

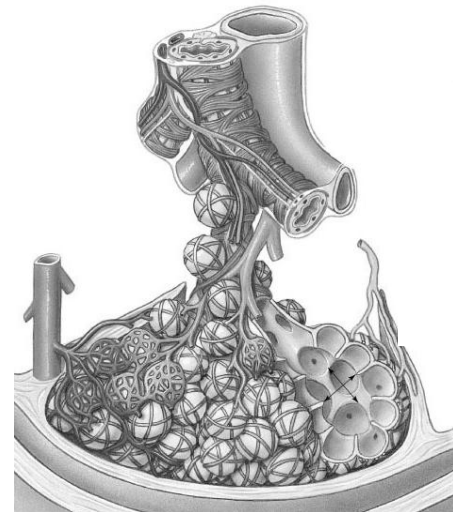
1. Name the components and functions of the male and female reproductive systems.
2. Name the primary and secondary sex characteristics of the male and female reproductive systems.
3. List the structures and explain the functions of spermatic cord, testes, and surrounding structures.
4. Describe process of spermatogenesis, where it takes place, and the path of the sperm.
5. Describe the structures and functions of the male reproductive tract & accessory glands.
6. Discuss the composition of semen.
7. Describe the external structures of the male reproductive system.
8. Discuss the hormones and their regulation of male reproductive activities.
9. Explain selected clinical disorders of the male reproductive system.
10. Describe the female gonads and their support structures.
11. Describe the process of oogenesis and where it takes place.
12. Describe the phases and steps of the ovarian and uterine cycles.
13. Describe the anatomy, histology, and functions of the uterine tubes, uterus, and vagina.
14. Describe the structures of the female external genitalia.
15. Describe the structures of the mammary glands and the hormones that influence their development and function.
16. Discuss the hormones and their regulation of the female reproductive cycle.
17. Describe the process of fertilization.
18. Discuss the early development of the embryo, fetus, and placenta.
19. Explain fetal circulation.
20. Discuss various aspects of menopause.
21. Discuss selected clinical disorders of the female reproductive system.



Course Objectives

Test #5: Respiratory System [Chapter 19]

1. Components of the Respiratory System
2. Divisions of Respiratory System - structural and functional
3. Functions of the Respiratory System
4. Def.: pulmonary ventilation, external respiration, internal respiration, cellular respiration
5. Nose and nasal cavity, and sinuses - anatomical features, functions, histology
6. Pharynx - 3 sections
7. Larynx - location, cartilages, ventricular folds and vocal folds
8. Trachea - location, cartilages, histology
9. Primary bronchi - differences between right and left, structure each supplies
10. Secondary bronchi - know the number, alternate name, and structure each supplies
11. Tertiary bronchi - know number, alternate name, structure each supplies
12. Bronchioles
13. Changes with increased branching
14. Lungs - pleural membranes and cavity
15. Lungs - anatomical features
16. Pulmonary lobule – components
17. Mechanics of inspiration and expiration
 - pressure differences, muscles involved in eupnea and forced inspiration and expiration
18. Gas laws - Boyle's, Dalton's, Henry's
19. Respiratory volumes and capacities
20. Blood flow to alveoli
21. Alveolar ventilation
22. Non-respiratory air movements
23. Control of respiration - medulla and pons
24. Control of respiration - chemoreceptors and baroreceptors, Hering-Breuer reflex
25. Alveoli - histology, cell types
26. Respiratory membrane
27. Composition of air
28. Gas transport – O₂ and CO₂
29. Chloride shift
30. CO (carbon monoxide)
31. Oxyhemoglobin dissociation curve
32. Adaptation to high altitudes
33. Clinical situations - pneumonia, asthma, lung cancer, emphysema, CF, pleurisy, pneumothorax, hemothorax, atelectasis, RDS, altitude sickness, decompression sickness, COPD, TB



Test #5 (Final Exam) is cumulative and will include questions on material from the entire semester.

Name: _____

Lab Day/Time: _____

Test Scores:

Test #1: _____

Test #2: _____

Test #3: _____

Test #4: _____

Extra Credit

Quiz points: _____

Test #5: _____

(Final exam)

Lab Prac. #1: _____

Lab Prac. #2: _____

Lab Prac. #3: _____

Total Prelab points: _____

Total points = _____

(Total pts. ÷ 9) = _____ = FINAL COURSE GRADE

Prelabs:

1: _____

2: _____

3: _____

4: _____

5: _____

6: _____

7: _____

8: _____

9: _____

10: _____

Total Prelab points: _____

Week due:

(wk. 2)

(wk. 3)

(wk. 4)

(wk. 6)

(wk. 7)

(wk. 8)

(wk. 9)

(wk. 11)

(wk. 12)

(wk. 13)