



**MERCER COUNTY COMMUNITY COLLEGE
DIVISION OF BUSINESS AND SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH
(STEM)**

COURSE OUTLINE

Course Number Bio103	Course Title Anatomy & Physiology I	Credits 4
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Hours:
lecture/Lab/Other
3/3/0

Pre-requisite: Proficiency in basic algebra.
Co-requisite: ENG 101

Catalog description :

Systemic approach to the structure and function of the human body; general terminology and organization; cells and tissues; integumentary, skeletal, muscular, and nervous systems. Laboratory includes use of microscope and the study of human anatomy via computer software and preserved specimens.

Does not fulfill any requirements for the Biology AS degree.

Required texts/other materials:

Textbook: Human Anatomy & Physiology
Erin Amerman
Pearson
2nd edition, 2018

Lab Manual: Exploring Anatomy & Physiology in the Laboratory: Core Concepts
Erin Amerman
Morton Publishing
2nd edition, 2018

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Revised Fall 2018

Course Competencies/Goals:

Student will be able to:

1. Use working vocabulary of appropriate terminology in the integumentary, skeletal, muscular and nervous systems.
2. Identify structures of the integumentary, skeletal, muscular and nervous systems.
3. Differentiate among various histological body tissue samples.
4. Explain the function of the organs within a particular system and their importance to that system's function and to maintaining homeostasis.
5. Correlate structure and function relationships within a particular system. Integrate knowledge of anatomical and physiological functions of the entire body.
6. Utilize concepts of the scientific method investigating laboratory/clinical data.

General Education Goals

Goal 1. Communication. Students will communicate effectively in both speech and writing.

Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Goal 3. Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

MCCC Core Skills

Goal A. Written and Oral Communication in English. Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.

Goal B. Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.

Goal D. Information Literacy. Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Goal E. Computer Literacy. Students will use computers to access, analyze or present information, solve problems, and communicate with others.

Unit I: Introduction to A&P, Terminology, Homeostasis, Organic Molecules, Cells, Transport Mechanisms, Organelles, DNA, Protein synthesis, Cell Division

Learning Objectives

The student will be able to...

1. Define anatomy and physiology. **(Course Goal 2; Gen Ed 1,3,4; Core A, B, D,E)**
2. Describe the major characteristics for living organisms and levels of organization. **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**
3. Identify the organ systems, the major components, and functions of each system. **(Course Goal 2; Gen Ed 1,3,4; Core A, B, D, E)**
4. Explain the concept of homeostasis and feedback mechanisms. **(Course Goal 3; Gen Ed 1,3,4; Core A, B, D, E)**
5. Define basic anatomical terminology including body cavities and membranes, directional, sectional, and regional terminology. **(Course Goal 2; Gen Ed 1,3,4; Core A, B, D, E)**
6. Discuss examples and basic functions of inorganic and organic compounds. **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**

7. Describe the structure and function of a typical animal cell and its components including transport mechanisms, DNA, and protein synthesis. **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**
8. Compare and contrast the processes of cell division (mitosis and meiosis). **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**
9. Discuss control of cell division, tumors, and stem cells. **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**
10. Discuss selected clinical terminology and health-related situations. **(Course Goal 5; Gen Ed 1,3,4; Core A, B, D, E)**

Unit 2: Tissues and the Integumentary System

Learning Objectives

The student will be able to...

1. Identify the four main tissue types and their general functions. **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**
2. Discuss specific examples and functions of epithelium and glandular tissues, connective, muscular, and nervous tissues. **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**
3. Discuss the four different types of membranes and their functions. **(Course Goal 1; Gen Ed 1,3,4; Core A, B, D, E)**
4. Describe the structure and function of the regions of the skin, including the hypodermis. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
5. Describe the accessory structures (hair, nails, and glands) associated with the skin. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
6. Explain differences in skin pigmentation and effects of UV radiation on skin. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
7. Explain the regulation of body temperature. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
8. Identify the exteroceptive senses (exteroceptors) and their main functions. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
9. Discuss selected clinical terminology and health-related situations. **(Course Goal 5; Gen Ed 1,3,4; Core A, B, D, E)**
10. Discuss life-span changes that affect the integumentary system. **(Course Goal 6; Gen Ed 1,3,4; Core A, B, D, E)**

Unit #3: Skeletal System

Learning Objectives

The student will be able to...

1. Describe the components and functions of the skeletal system. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
2. Classify the bones according to shape including the parts of long bone. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
3. Compare and contrast spongy bone and compact bone, and the differences between the various bone cells and their function in remodeling. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
4. Distinguish between intramembranous and endochondral ossification. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
5. Discuss the effects of hormones, diet, exercise, and aging on the skeletal system. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
6. Identify major surface features of bones. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
7. Identify bones of the axial skeleton and appendicular skeleton and their major surface features. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
8. Identify the characteristics of the vertebral regions and the vertebral column curvatures. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**

9. Identify the bones that form the pectoral and pelvic girdles, the thoracic cage, and the upper and lower limbs. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
10. Discuss the skeletal differences between females and males. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
11. Describe the major classifications of joints based on structure and functions and give examples of each. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
12. Discuss selected clinical terminology and health-related situations. **(Course Goal 5; Gen Ed 1,3,4; Core A, B, D, E)**
13. Discuss life-span changes that affect the skeletal system. **(Course Goal 6; Gen Ed 1,3,4; Core A, B, D, E)**

Unit #4: Muscular System

Learning Objectives

The student will be able to...

1. Describe the characteristics and functions of the 3 muscle tissues. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
2. Describe the organization of skeletal muscle at the tissue level. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
3. Describe the microanatomy of skeletal muscle fibers. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
4. Explain the sliding filament model of muscle contraction. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
5. Describe the parts of the neuromuscular junction (NMJ). **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
6. Explain the series of events that take place at the NMJ and key steps in contraction and relaxation of skeletal muscle fibers. **(Course Goal 4; Gen Ed 1,2,3,4; Core A, B, D, E)**
7. Give definitions for the different types of muscle contractions (twitch, summation, recruitment, muscle tone, isometric, and isotonic). **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
8. Describe how muscle fibers obtain and utilize energy for contraction. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
9. Define origin, insertion, and action and the naming of muscles. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
10. Discuss selected clinical terminology and health-related situations. **(Course Goal 5; Gen Ed 1,3,4; Core A, B, D, E)**
11. Discuss life-span changes that affect the muscular system. **(Course Goal 6; Gen Ed 1,3,4; Core A, B, D, E)**

Unit #5: Nervous System

Learning Objectives

The student will be able to...

1. Name the 2 major anatomical divisions of the nervous system and describe the organization and characteristics of each. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
2. Discuss the classification and functions of neurons and neuroglia. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
3. Describe the resting potential and the events in the generation and propagation of an action potential (AP). **(Course Goal 4; Gen Ed 1,2,3,4; Core A, B, D, E)**
4. Describe the synapse, sequence of events in synaptic transmission, and various neurotransmitters. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
5. Describe the difference between white matter and gray matter. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**

6. Describe the structure and function of the major regions of the brain. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
7. Discuss the blood supply to the brain and the importance of the blood brain barrier (BBB). **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
8. Discuss the formation, circulation, and functions of CSF. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
9. Identify the cranial nerves and important individual functions. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
10. Discuss the structure and functions of the spinal cord and spinal nerves. **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
11. Compare and contrast the structures and functions of the sympathetic and parasympathetic divisions of the autonomic nervous system (ANS). **(Course Goal 4; Gen Ed 1,3,4; Core A, B, D, E)**
12. Discuss selected clinical and health-related situations. **(Course Goal 5; Gen Ed 1,3,4; Core A, B, D, E)**
13. Discuss life-span changes that affect the nervous system. **(Course Goal 6; Gen Ed 1,3,4; Core A, B, D, E)**

Attendance and Grading:

1. Attendance at lectures is expected. To be successful in this course you should plan to attend all lecture and lab 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. The tests covering the lecture material will be given periodically at the end of study of a unit or system. You need to bring your MCCC student ID to each exam. **You are expected to arrive on time in order to take the test.** The tests will be announced at least one week in advance. There will be four regular lecture exams plus one comprehensive final exam.
3. 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 the final exam will be counted twice. If you miss a second lecture exam you will receive a zero for that exam.
4. The laboratory grade is based on the lab practical grades, quizzes, prelab assignments, and attendance. Three unexcused absences from lab may result in an automatic F for the course no matter how high the lecture grade.
5. Grading: You may keep track of your grades 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 is cumulative and will be given during the final exam period. In order to pass the course you must take the final exam.

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. Refer to Student Handbook for additional information on Academic Integrity Policy.

9. **Classroom & Laboratory Conduct:** Students are expected to be on time for all classes. If a student walks into a class after it has begun, she/he should sit near the exit so as not to disrupt others. In addition, students are expected to follow ordinary rules of courtesy during class sessions. The use of cell phones and other electronic devices, and engaging in side conversations during class time is distracting to other students and the instructor. **No cell phone use, including texting, during class and lab time.**

Participation in biology laboratory courses is permitted provided the student has completed the required prerequisites, is a minimum of 16 years of age, or by permission of the instructor and the Dean of the division. Children are not permitted in the classroom without prior approval by the instructor.

The instructor has the right to eject a disruptive student from the class at any time. Please refer to the Student Handbook for additional information on rules and regulations.

Mercer County Community College is in compliance with both the ADA and section 504 of the Rehabilitation Act. If you have, or believe you have, a differing ability that is protected under the law please see Arlene Stinson in LB 216 or at stinsona@mccc.edu for information.

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

Schedule of Lecture Topics and Laboratory Work

Week	Subject	Text Chapters	Lab
1	Intro., Terminology, Homeostasis, Organic Molecules	1, 2 (p. 45-63)	Intro. to A&P <i>(Unit 1)</i> Microscope <i>(Unit 3: Ex.3-1)</i>
2	Cells – Membranes, Transport Processes, Organelles	3	Intro. to Cell & Microscope (Diffusion, Osmosis, Tonicity) <i>(Unit 3: Ex.3-3,3-4)</i>
3	DNA, Protein synthesis, Cell division	3, 26 (p. 1013-1018)	Mitosis & Cell Cycle <i>(Ex. 3-5)</i> Meiosis <i>(Ex. 16-3, 16-4)</i> Epithelial & Connective Tissues <i>(Ex.4-1, 4-2)</i>
	Lecture Test #1 [Intro.→Cell Div.]		
4	Histology	4	Integumentary System <i>(Unit 5)</i> Review - Lab Practical #1

5	Integumentary System	5	 Lab Practical #1
	Lecture Test #2 [Tissues & Skin]		
6	Skeletal System	6, 7, 8	Skeletal System <i>(Unit 6)</i>
7	Skeletal System	6, 7, 8	Skeletal System <i>(Unit 6)</i> APR Computer Exercise: Skeletal System
8	Skeletal System	6, 7, 8	Skeletal System <i>(Unit 6)</i> Review - Lab Practical #2
	Lecture Test #3 [Skeletal System]		
9	Muscular System	9, 10	 Lab Practical #2
10	Muscular System	9, 10	Muscle Tissue & selected Muscles <i>(Unit 7)</i> Special Senses – Eye & Ear <i>(Unit 9)</i> APR Computer Exercise: Muscular Sys., Eye & Ear
11	Muscular System	11-14	Nervous System (Unit 8)
	Lecture Test #4 [Muscular System]		
12	Nervous System	11-14	Cranial Nerves <i>(Ex. 8-4)</i> Review - Lab Practical #3
13	Nervous System	11-14	 Lab Practical #3
14	Nervous System		
	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
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 and cleaning solution on the lab work table and dissection trays as directed.
2. Be certain to wear latex, plastic, or rubber gloves and goggles.
3. Be careful not to cut yourself or your partner with the dissecting instruments. Never cut toward yourself and always put the instruments down when not in use. 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 dissection specimens as directed, dispose of the paper towels in the appropriate container, 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. **Also, do not smoke, eat, drink, or bite your nails in the laboratory.**
7. **Photography is not permitted in the laboratory.**
8. Although dangerous chemicals are used infrequently, always read labels and follow instructions carefully.
9. Before leaving the laboratory, make certain that the gas jets at your station are off and push your chair under the lab table.
10. Make sure the lab bench is cleaned and organized for the next lab group

BIO 103: Learning Outcomes

Test #1: Introduction to A&P, Terminology, Homeostasis, Organic Molecules, Cells, Transport Mechanisms, Organelles, DNA, Protein synthesis, Cell Division
[Chapters 1, 2 (p. 45-63), 3, and 26 (p. 1013-1018)]

1. Define anatomy and physiology.
2. Describe the major characteristics of life.
3. Describe the major requirements of organisms.
4. Identify the levels of organization.
5. Identify the organ systems, the major components, and functions of each system.
6. Explain the concept of homeostasis and its importance for living organisms.
7. Describe how negative and positive feedback are involved in maintaining homeostasis.
8. Use anatomical terms to describe body sections, regions, and positions.
9. Identify major body cavities, their subdivisions, and membranes.
10. Distinguish between inorganic and organic compounds.
11. Discuss the structures and functions of the major classes of organic compounds.
12. List the structural components of the cell membrane and some important functions.
13. Describe the organelles of a typical animal cell and explain the functions of each.
14. Explain the function of the nucleus of a cell.
15. Explain how ions and molecules can enter or leave the cell.
16. Describe the various transport mechanisms that are utilized by cells.
17. Discuss how DNA molecules store genetic information.
18. Summarize protein synthesis.
19. Describe the stages of the life cycle of the cell.
20. Describe the process of mitosis and its significance.
21. Describe the process of meiosis and its significance.
22. Discuss control of cell division, tumors, and stem cells.
23. Selected clinical terminology.
24. Selected clinical or health-related situations.

Learning Outcomes

Test #2: Tissues, and the Integumentary System [Chapters 4 and 5]

1. Identify the four main tissue types and their general functions.
2. Discuss the types and functions of epithelial cells.
3. Compare the structures and functions of the various connective tissues.
4. Describe characteristics and examples of exocrine and endocrine glands
5. Discuss the four different types of membranes and their functions.
6. Describe the three types of muscle tissues and characteristics of each.
7. Describe the general characteristics and functions of nervous tissue.
8. Describe the structure and function of the epidermis.
9. Explain individual and racial differences in skin.
10. Discuss the effects of UV radiation on skin.
11. Describe the structure and function of the dermis.
12. Discuss the structure and function of the hypodermis.
13. Identify the parts of the hair follicle and the functions of hair.
14. Discuss the various glands that are associated with the skin.
15. Explain the regulation of body temperature.
16. Describe the anatomy of nails.
17. Identify the exteroceptive senses (exteroceptors) and their main functions.
18. Selected clinical terminology.
19. Selected clinical or health-related situations.

Learning Outcomes

Test #3: Skeletal System [Chapters 6, 7 and 8]

1. Describe the functions of the skeletal system.
2. Classify the bones according to shape.
3. Identify the various bone cells and their main functions.
4. Compare and contrast spongy bone and compact bone.
5. Distinguish between intramembranous and endochondral ossification.
6. Describe the remodeling process.
7. Discuss the effects of hormones, diet, exercise, and aging on the skeletal system.
8. Describe the different types of fractures.
9. Identify major surface features of bones.
10. Identify the bones of the axial skeleton.
11. Identify the various curvatures of the spinal column.
12. Identify the characteristics of the vertebral regions.
13. Explain the significance of the articulations of the thoracic cage.
14. Identify the bones of the appendicular skeleton.
15. Identify the bones that form the pectoral girdle.
16. Identify the bones of the upper and lower limbs.
17. Identify the bones that form the pelvic girdle.
18. Discuss the skeletal differences between females and males.
19. Compare the major classifications of joints.
20. Describe the basic structure of a synovial joint and the various types.
21. Selected clinical terminology.
22. Selected clinical or health-related situations.

Learning Outcomes

Test #4: Muscular System [Chapter 9 and 10]

1. Describe the characteristics and functions of the three muscle tissue.
2. Describe the organization of skeletal muscle at the tissue level.
3. Describe the microanatomy of skeletal muscle fibers.
4. Identify the components and banding patterns in the sarcomere.
5. Explain the sliding filament model of muscle contraction.
6. Describe the parts of the neuromuscular junction (NMJ).
7. Explain the series of events that take place at the NMJ when a neuron stimulates a skeletal muscle fiber.
8. Explain the key steps in contraction and relaxation of skeletal muscle fibers.
9. Give definitions for the different types of muscle contractions (twitch, summation, recruitment, muscle tone, isometric, and isotonic).
10. Describe how muscle fibers obtain and utilize energy for contraction.
11. Compare aerobic and anaerobic training.
12. Define origin, insertion, and action.
13. Explain how names of muscles can help identify its location, shape, or action.
14. Selected clinical terminology.
15. Selected clinical or health-related situations.

Learning Outcomes

*Test #5: The Nervous System [Chapters 11 - 14]

1. Name the 2 major anatomical divisions of the nervous system and describe the organization and characteristics of each.
2. Identify the structures of a neuron and describe the function of each.
3. Classify neurons based on structure and function.
4. Describe the locations and functions of neuroglia.
5. Describe the resting potential - how it is created and maintained.
6. Describe the events in the generation and propagation of an action potential (AP).
7. List the factors that affect the speed of conduction of an AP.
8. Describe the synapse and sequence of events in synaptic transmission.
9. Name the main types of neurotransmitters that were discussed in class.
10. Name the factors that affect neural activity.
11. Discuss conditions that are necessary for regeneration of nerves.
12. Describe the difference between white matter and gray matter.
13. Name the major regions of the brain and describe their main function.
14. Explain how the brain is protected and supported.
15. Discuss the blood supply to the brain and the importance of the BBB.
16. Discuss the formation, circulation, and functions of CSF.
17. Identify the cranial nerves and important individual functions.
18. Discuss the structure and functions of the spinal cord.
19. Describe the location of white and gray matter in the spinal cord and the role they play in processing and relaying information.
20. Describe the numbering and location of the spinal nerves and their components.
21. Name the main plexuses and the important nerves that arise from each.
22. Describe the reflex arc and give examples of the different types of reflexes as discussed in lecture.
23. Compare the ANS with other divisions of the nervous system.
24. Compare and contrast the structures and functions of the sympathetic and parasympathetic divisions of the ANS.
25. Selected clinical or health-related situations.

* Test #5 is cumulative and will include material covered during the entire semester.

Name: _____

Lab Day/Time: _____

Test Scores:

Pre-lab or Lab Quiz Points

Test #1: _____

1: _____

Test #2: _____

2: _____

Test #3: _____

3: _____

Test #4: _____

4: _____

Test #5: _____

5: _____

(Final exam)

Extra Credit

6: _____

Quiz points: _____

7: _____

Lab Prac. #1: _____

8: _____

Lab Prac. #2: _____

9: _____

Lab Prac. #3: _____

10: _____

Prelab / Lab quiz points: _____

Total points = _____

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

Anatomy & Physiology Websites:

A&P (Bio103) Website: <http://www.mccc.edu/~falkowl>

<http://www.pearsonmylabandmastering.com/northamerica/masteringaandp/>

Master A & P / Companion website for the Amerman textbook.

<http://www.gwc.maricopa.edu/class/bio201/index.htm> Maricopa Community College

From this webpage, click on "Tutorials" and "BIO201 Study Q" on left side of page for practice on the skull, vertebrae, muscles, histology, cranial nerves, and brain.

<http://msjensen.cehd.umn.edu/> Univ. of Minnesota

A potpourri of study aids for the beginning A&P student. Includes self tests and images from all major system of the body.

<http://www.bio.psu.edu/faculty/strauss/anatomy> Penn State University links to great photos of skeletal and nervous systems.