

BIO K211 - Anatomy & Physiology I

Lecture: F 8:00am-10:45am, Room C101

Lab: F 12:00pm-2:55pm, Room A219

Course Information

- **Instructor Information**

Name: Justin Gwaltney

Office: TBD

Email: jgwaltney@trcc.commnet.edu

Office Hours: contact to make arrangements

- **Course Description**

4 CREDIT HOURS

Prerequisites: BIO K121 and CHE* K111 or higher passed with a “C” grade or better.*

This course is a comprehensive study of the gross anatomical structure and physiology of the human body pertaining to cells, tissues, membranes, organs, and the following systems: integumentary, skeletal, articular, muscular and nervous including special senses. Anatomy and Physiology is a two-semester course. Students must enroll in both BIO* K211 and BIO* K212 for transfer credits to other institutions. Three-hour lecture; one three-hour laboratory period per week.

- **Required Materials**

Text: (1) ***Fundamentals of Anatomy and Physiology***, Frederic H. Martini, 9th edition or newer, Prentice Hall Publisher.

(2) ***Human Anatomy & Physiology I Laboratory Exercises Manual***

Other required materials

Dissecting kit, Non-latex disposable gloves, Lab coat & Safety goggles.

- **Learning Outcomes**

Upon successful completion of this course, a student should be able to:

Course Learning Outcomes (Objectives): Human Anatomy and Physiology I

1. The student will develop “critical thinking skills” and will be able to draw sound scientific conclusions through the analysis of scientific data.
2. The student will demonstrate knowledge of the organization of the body on the cellular, tissue and organ-system levels.
3. The student will demonstrate knowledge of body positions and planes of reference.
4. The student will demonstrate knowledge of the types of tissues, membranes, and their functions.
5. The student will demonstrate knowledge of the organization of the integumentary system and its various functions.
6. The student will demonstrate knowledge of the relationship of the integumentary system to homeostasis.
7. The student will demonstrate knowledge of the development of bone tissue.
8. The student will demonstrate knowledge of bone tissue structurally and functionally.
9. The student will be able to identify the bones of the body and their prominent markings.
10. The student will demonstrate knowledge of the articulations of the body and explain their structural differences and their functions.
11. The student will demonstrate knowledge of the different types of muscle tissues; give their anatomical location and primary functions.
12. The student will demonstrate knowledge of the neuroelectrical chemical factors of muscle contraction.
13. The student will demonstrate knowledge of the mechanisms for supplying energy in muscle contraction.
14. The student will demonstrate knowledge of the types of muscle contraction.
15. The student will be able to name, give the attachments and action of the major groups of skeletal muscles.
16. The student will be able to explain the general function of the nervous system.
17. The student will be able to list the divisions of the nervous system and the composition of each division.
18. The student will be able to describe the general structure and function of a neuron.
19. The student will be able to explain how neurons are classified.

20. The student will be able to name the different types of neurological cells and describe their functions.
21. The student will be able to explain how an injured nerve fiber may regenerate.
22. The student will be able to explain the events that lead to the conduction of a nerve impulse.
23. The student will be able to explain the electrochemical changes associated with impulse transmission.
24. The student will be able to explain the electrochemical changes associated with synaptic transmission.
25. The student will be able to name the parts of a reflex arc and describe the function of each part.
26. The student will be able to name the different types of reflex arcs.
27. The student will be able to describe the coverings of the brain and spinal cord.
28. The student will be able to describe the vascular/cerebrospinal fluid system of the central nervous system.
29. The student will be able to describe and explain the structure, organization and function of the spinal cord.
30. The student will be able to describe and explain the structure, organization and function of the brain.
31. The student will be able to give the location and function of the spinal nerves.
32. The student will be able to give the location and function of the cranial nerves.
33. The student will be able to describe the structure, organization and function of the autonomic nervous system.
34. The student will be able to describe and explain the structure and function of the specialized sensory receptors.
35. The student will be able to give the location of the olfactory organs and explain their primary functions.
36. The student will be able to describe the structure and function of the tongue.
37. The student will be able to describe the structure and function of the ear.
38. The student will be able to describe the structure and function of the eye.

Grading

- **Methods of Evaluation**

Your semester grade is out of 900 points. See breakdown below.
There are no “extra credit” assignments given.

Point Distribution

Item	Possible Point total
10` weekly Lecture quizzes each worth 10 points (lowest 1 will be dropped)	90 points
3 Unit Tests (100 questions each)	300 points
4 laboratory practical's (50 points each)	200 points
10 weekly post-lab quizzes (lowest 2 will be dropped)	80 points
1 abbreviated laboratory Report	30 points
Cumulative Final (200 questions)	200 points
Semester total	900 points

- **Grading Policies**

Assessment

Lecture Portion: Points will be awarded from multiple assessment styles. Any and/or all of the following may be used: multiple choice, true/false, matching, fill in the blank, short answer, and essay.

Laboratory Portion: There will be three lab practical exams given during the course of the semester. These lab practical's will be based on your individual recall ability and will not be multiple choice, also, word banks will not be given.

- **Missed Work Make-Up Policy**

Quizzes in lecture and lab CANNOT be made up and they cannot be taken early.

Makeup tests will be granted on an individual basis only following a conference with the instructor; where the reason(s) for missing the test must be determined as mitigating circumstances beyond the control of the student such as, illness, death in the family, or change in condition of employment. All make-up tests will be scheduled at the convenience of the instructor (typically office hours) and **must be made up within 48 hours of the original test date and time**. Only one (1) Unit Test make-up will be allowed.

Laboratory exercises can be made up, please come see me to discuss alternate days and times that lab is being done. Lab practicals CANNOT be made up. There is a possibility of taking a lab practical with another section, on another day and time, but this MUST be discussed and approved prior. If you fail to discuss this with me and do not show up to a scheduled practical, you will receive a zero, with no option of taking it with another section.

- **Letter Grade Equivalents**

94.00 or higher = A

90 - 93 = A-

87 - 89 = B+

84 - 86 = B

80 - 83 = B-

74 - 76 = C

70 - 73 = C-

67 - 69 = D+

64 - 66 = D

60 - 63 = D-

59 or lower = F

Classroom Policies

- **Attendance:** Attendance to every lecture and lab is required. Failure to attend will affect your semester grade.
- **Communication:** All communication will occur by email or BlackBoard. Please make sure that you check your TRCC email or set it up to forward to another account. Check your email regularly to be informed of any changes in schedule.
- **Class Cancellation:** If school is cancelled, notification of cancellation due to inclement weather will be available by telephone by 6:00 am for daytime classes and by 2:30 pm for evening classes by calling the College's main telephone at (860) 215-9000, pressing 1, and listening to the taped announcement. The College's website will also have announcements available by accessing the www.threerivers.edu home page. The myCommnet Alert Notification System will also be used to deliver important information regarding weather-related class cancellations, via both email messages and text messages, to registered individuals. To register, log on to your myCommnet account at <http://my.commnet.edu/> and follow the link to myCommnet Alert.

If class is cancelled by the instructor, a notice will be placed on the classroom door and on BlackBoard. If time permits, students may be notified by a message via email.

- **Withdrawal Policy:** You may withdraw from this class any time up to and including November 5th, 2019 and you will receive a W grade on your transcript. However,

you must complete a withdrawal form in the Registrar's Office at the time of withdrawal; *if you merely stop attending classes you will be assigned a grade of F.* Any eligibility for refund of tuition is based on the date that the registrar receives the withdrawal.

- **Academic Integrity:** The effective operation of any organization is dependent on the honesty and goodwill of its members. In an organization devoted to the pursuit of knowledge, acting with integrity is essential to effective teaching and learning. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. To emphasize the importance of academic integrity, Three Rivers Community College adheres to the Student Code of Conduct and Discipline Policy, as provided by the Connecticut State Colleges and Universities (CSCU) - Board of Regents for Higher Education. (Please refer to BlackBoard for the complete statement.)

Some of the behaviors that will be considered cheating are:

- Communicating with another student during a quiz or exam
- Copying material from another student during a quiz or exam or from any assignment being graded
- Allowing another student to copy from your quiz, exam, or any assignment being graded
- Use of unauthorized assistance on any assignment being graded
- Use of unauthorized notes or books during a quiz or exam
- Providing or receiving a copy of a quiz or exam used in the course
- Use of a cell phone or pager to transmit information during a quiz or exam

Tentative Schedule

This is the tentative schedule - instructor reserves the right to change dates throughout the semester. It is your responsibility to attend class to learn of any changes in schedule.

See the end of this syllabus for the schedule

School Policies

Please refer to BlackBoard for a link to the entire policy.

- **Digication:** All students are required to maintain an electronic portfolio using the College template within Digication. Digication can be accessed at <https://threerivers.digication.com>.
- **Disability:** Three Rivers Community College (TRCC) is committed to the goal of achieving equal educational opportunity and full participation for individuals with disabilities. To this end, TRCC seeks to ensure that no qualified person is excluded

from participation in, is denied the benefit of, or otherwise is subjected to discrimination in any of its programs, services, or activities.

- **Non-discrimination:** Three Rivers Community College does not discriminate on the basis of race, color, religious creed, age, sex, national origin, marital status, ancestry, present or past history of mental disorder, learning disability or physical disability, sexual orientation, gender identity and expression, or genetic information in its programs and activities.
- **Sexual Misconduct:** The Board of Regents for Higher Education (BOR) in conjunction with the Connecticut State Colleges and Universities (CSCU) is committed to insuring that each member of every BOR governed college and university community has the opportunity to participate fully in the process of education free from acts of sexual misconduct, intimate partner violence and stalking.

ALL DATES ARE OPEN TO REVISIONS NEEDED AT INSTRUCTORS DISCRETION

Date	Lecture	Laboratory
8/30 Semester starts on Tues. 8/27.	Chapter 1: An Introduction to Anatomy and Physiology Chapter 4: The Tissue Level of Organization	Syllabus Safety Rules & Procedure Agreement Lab exercises: Anatomical Terminology <u>Quiz 1</u>
9/6	Quiz #1 Chapter 5: The Integumentary System Chapter 6: Osseous Tissue and Bone Structure	Microscope Review Histology - Prepared Slides Quiz 2
9/13	Chapter 6: Osseous Tissue and Bone Structure Unit Test #1: Chpts. 1,4,5, & 6	Histology- Prepared Slides skulls Quiz 3
9/20	Quiz #2 Chapter 7 & 8 (intro) Chapter 9: Articulations	Lab Practical #1 Chapter 7: Axial Skeleton and Landmarks Chapter 8: Appendicular Skeleton and Landmarks
9/27	Quiz #3 Chapter 10: Muscle Tissue	Chapter 7: Axial Skeleton and Landmarks Quiz 4

10/4	Quiz #4 Chapter 10: Muscle Tissue Chapter 11: The Muscular System	Chapter 8: Appendicular Skeleton and Landmarks Quiz 5
10/11	Quiz #5 Chapter 12: Neural Tissue	Bones and landmarks Quiz 6
10/18	Test #2 (chapters 7-12) Chapter 13: The Spinal Cord, Spinal Nerves, and Spinal Reflexes	Lab practical #2: Skeletal System Begin cat dissection (skinning)/ CH 12 lecture if necessary
10/25	Quiz #6 Chapter 13: The Spinal Cord, Spinal Nerves, and Spinal Reflexes Chapter 14: The Brain and Cranial Nerves	Cat Dissection Superficial Muscles Quiz 7
11/1	Quiz #7 Chapter 14: The Brain and Cranial Nerves Chapter 15: Sensory Pathways and The SNS	Cat Dissection Deep Muscles Quiz 8
11/8	Quiz #8 Chapter 15: Sensory Pathways and The SNS	Cat dissection continued Quiz 9
11/15	Quiz #9 Chapter 16: ANS	Lab practical #3: Cat Muscles Brain dissection prep Eye/Ear & Cranial nerve handouts
11/22	Quiz #10 Chapter 16: ANS Chapter 17: Special Senses	Eye/Ear Dissection & Models Brain dissection Quiz 10

	No Class on Friday Thanksgiving Break	XXXXXX
12/6	Chapter 17: Special Senses Test #3 (chapters part 13-17)	Practical #4: Brain, ear, eye Review for final
12/13	FINAL EXAM 9:30am-12:30pm	

Study Guide

UNIT I

- A) Anatomy and Physiology Defined
 - 1) Subdivisions of anatomy and physiology
- B) Terms of Location and Anatomical Position
 - 2) Superior/Inferior
 - 3) Anterior/Posterior
 - 4) Ventral/Dorsal
 - 5) Cranial/Caudal
 - 6) Proximal/Distal
 - 7) Internal/External
 - 8) Peripheral/Deep
 - 9) Medial

- 10) Lateral
- 11) Central
- 12) Parietal
- 13) Visceral

C) Fundamental Planes

- 1) Coronal or Frontal
- 2) Transverse or Horizontal
- 3) Sagittal
- 4) Medial
- 5) Lateral

D) Cavities

- 1) Coelom
- 2) Thoracic
 - 1) pericardial
 - 2) pleural
- 3) Abdominal
- 4) Pelvic
- 5) Orbital
- 6) Nasal
- 7) Buccal

E) Organization of the body

- 1) Cells
- 2) Tissues
- 3) Organs
- 4) Systems
 - a) integumentary
 - b) skeletal
 - c) muscular
 - d) nervous

- e) endocrine
- f) circulatory
- g) respiratory
- h) digestive
- i) excretory
- j) reproductive

A) The movement of materials across the cell membrane

- 1) Diffusion
 - a) osmosis
 - b) dialysis
 - c) facilitated diffusion
- 2) Active transport
- 3) Endocytosis
 - a) pinocytosis
 - b) phagocytosis

1. Histology

2. Specialization of Cells (Tissues)

A) Structure and Function of the tissues

- 1) Epithelial
- 2) Connective
- 3) Muscular
- 4) Nervous

B) Membranes

- 1) Serous
- 2) Mucous
- 3) Cutaneous
- 4) Synovial

3. The Integumentary System

A) The skin and its tissues

- 1) Structure
 - 2) Function
- B) Appendages and Glands of the skin
- C) Pigmentation

UNIT II

1. The Skeletal System

- A) Types of bones cells and their functions
 - 1) Osteoblasts
 - 2) Osteoclasts
 - 3) Osteocytes
- B) The Bony Matrix
- C) Types of Bone Tissue
 - 1) Compact
 - 2) Spongy
- D) Membranes of Bone Tissue
 - 1) Periosteum
 - 2) Endosteum
- E) Classification of Bones
 - 1) Long
 - 2) Short
 - 3) Flat
 - 4) Irregular
 - 5) Sesamoid
- F) Formation and Growth of Bones
 - 1) Membranous Ossification
 - 2) Endochondrial Ossification
 - 3) Factors affecting bone growth and development
 - a) vitamins & minerals
 - b) hormones
 - c) physical exercise

- 4) The anatomy and physiology of fractures
- G) Divisions of the Skeletal System and their Bones
- 1) Axial: 80 bones
 - 2) Appendicular: 126 bones
 - a) pectoral girdle
 - b) pelvic girdle
 - 3) Descriptive Terms
 - a) processes: process, condyle, tubercle, tuberosity, trochanter, crest, spine, head
 - b) cavities and depressions: groove, sinus, atrum, cornal, meatus, foramen, fissure
fovea, fossa
- H) Arthrology: joints of articulation
- 1) Synarthroses (immovable joints)
 - a) synchondroses
 - b) sutures
 - 2) Amphiarthroses (slightly movable joints)
 - a) joints between the vertebrae
 - b) joints between the pubis and sacroiliac
 - 3) Synovial-Diathrososes (free moving joints)
 - a) ball and socket
 - b) hinge
 - c) pivot
 - d) condyloid
 - e) gliding
 - f) saddle
 - 4) Movements permitted by Diarthroses (synovial joints)
 - a) angular movements: flexion, extension, abduction, adduction, elevation, depression
 - b) circumduction
 - c) rotation

d) Special movements:

- 1) supination
- 2) pronation
- 3) inversion
- 4) eversion
- 5) protraction
- 6) retraction

5) Practical Terms Related to the Skeletal System

- a) sprain
- b) dislocation
- c) bursitis
- d) arthritis
- e) osteomyelitis
- f) kyphosis
- g) lordosis
- h) scoliosis

2. The Muscular System

A) Types, location and function of muscle tissue

- 1) smooth muscle
- 2) cardiac muscle
- 3) striated or skeletal muscle

B) Contraction of muscle tissue

- 1) Conditions of contraction
 - a) stimuli
 - b) response to stimuli
 - c) chemical changes
- 2) Types of contraction
- 3) The physiology of skeletal muscle contraction

C) Skeletal muscles

- 1) Naming
 - a) directions of fibers
 - b) location
 - c) size
 - d) number of origins
 - e) shape
 - f) origin and insertion (attachments)
 - g) action
 - 2) Grouping
 - a) prime mover - antagonist
 - b) prime mover - synergist
- D) Skeletal Muscles and Their Bony Levers
- 1) The principle action of skeletal muscles
 - a) flexor
 - b) extensor
 - c) abductor
 - d) adductor
 - e) levator
 - f) depressor
 - g) supinator
 - h) pronator
 - i) sphincter
 - j) tensor
 - k) rotator

UNIT III

1. The Nervous System
 - A) The function of the Nervous System
 - B) The organs of the Nervous System

- 1) Brain
- 2) Spinal cord
- 3) Membranes
- 4) Nerve cords
- 5) Ganglion
- 6) Nerve nucleus

C) The Cells and Tissues of the Nervous System

- 1) Supportive tissues and their function
 - a) neuroglia cells
 - 1) astrocytes
 - 2) oligodendrocytes
 - 3) microglia cells
 - 4) ependyma
- 2) The Neuron
 - a) anatomy
 - 1) nerve cell body
 - 2) nissl bodies (chromtophilic substances)
 - 3) dendrites
 - 4) axons
 - 5) axoplasm
 - 6) axolemma
 - 7) neurolemmacytes (Schwann cells)
 - b) function of neurons
 - c) types of neurons
 - 1) unipolar
 - 2) bipolar
 - 3) multiopolar
 - 4) sensory
 - 5) association - connection-interneuron

- 6) motor
- 3) Nerve Impulse transmission
- 4) The Synapse and Impulse Transmission
- 5) Nerve Regeneration
- 6) The Function (behavior) Unit of the Nervous System
 - a) The reflex arc
 - 1) composition
 - 2) types

2. The Divisions of the Nervous system

A) The Central Nervous System

- 1) Membranes
- 2) The spinal cord
 - a) structure
 - b) functions
 - c) pathways
 - 1) ascending tracts
 - a) fasciculus gracilis
 - b) fasciculus cuneatus
 - c) spinothalamic (lateral and anterior)
 - 2) descending tracts
 - a) corticospinal
 - b) reticulospinal
 - c) rubrospinal tracts
 - d) spinal cord injuries
 - 1) spinal shock
 - 2) paralysis
 - a) flaccid paralysis
 - b) spastic paralysis

2. The Brain

- a) structural make-up

- b) lobes
 - c) organization
 - 1) cerebrum
 - 2) ventricles
 - 3) thalamus
 - 4) hypothalamus
 - 5) limbic system
 - 6) pineal gland
 - 7) pons
 - 8) medulla oblongata
 - 9) cerebellum
 - d) functions
 - B. The Peripheral Nervous System
 - 1) The cranial nerves
 - a) location
 - b) function
 - 2) The spinal nerves
 - a) location
 - b) function
 - C. The Autonomic Nervous System
 - 1) Sympathetic division
 - 2) Parasympathetic division
 - 3) Autonomic transmitters
 - D) Clinical terms related to the Nervous System
3. Somatic and Special Senses
- A) Receptors
 - 1) Types
 - a) mechanical
 - 1) free-nerve (dendritic) ending

- 2) meissner's corpuscles
- 3) merkel's disks
- 4) pacinian corpuscles
- 5) hair cells
- 6) baroreceptors
- 7) proprioceptors
- 8) root hair plexuses
- 9) muscle spindles
- 10) golgi tendon organs
- 11) krause end bulbs
- 12) ruffini's corpuscles

b) photoreceptors

- 1) rods
- 2) cones

c) chemoreceptors

- 1) olfactory cells
- 2) taste buds (gustatory hairs)
- 3) aortic bodies
- 4) carotid bodies

d) thermoreceptors

e) nociceptors

2) Functions

B) The Sense of smell

- 1) Olfactory cells and their function

C) The Sense of Taste

- 1) Taste Buds and their function

D) The Ear

- 1) structural makeup
- 2) physiology of hearing
- 3) equilibrium
 - a) static
 - b) dynamic

E) The Eye

- 1) structural makeup
- 2) physiology of sight
- 3) common disorders