

BIO K211 - Anatomy & Physiology I

**Lecture: T & R 9:30am-10:45am, Room C101**

**Lab: T or R 11am-1:55pm, Room A219**

**Course Information**

* **Instructor Information**

|  |  |
| --- | --- |
| Name: Nicola Ricker  Office: C270  Phone: 860-215-9474  Email: Nricker@trcc.commnet.edu | Office Hours: M/W: 9:30am-10:50am  R: 2pm-3:30  Other hours can be arranged. Please come see me. |

* **Course Description**

**4 CREDIT HOURS**   
Prerequisites: [***BIO\* K121***](https://catalog.threerivers.edu/content.php?catoid=5&navoid=250#tt3220) and [***CHE\* K111***](https://catalog.threerivers.edu/content.php?catoid=5&navoid=250#tt7945) 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**](https://catalog.threerivers.edu/content.php?catoid=5&navoid=250#tt6023) and [**BIO\* K212**](https://catalog.threerivers.edu/content.php?catoid=5&navoid=250#tt4990) 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 if 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. EVER.

Point Distribution

|  |  |
| --- | --- |
| Item | Possible Point total |
| 12 weekly Lecture quizzes each worth 10 points (lowest 2 will be dropped) | 100 points |
| 3 Unit Tests (100 questions each) | 300 points |
| 3 laboratory practical’s (70 points each) | 210 points |
| 11 weekly post-lab quizzes (lowest 2 will be dropped) | 90 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, sort 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 REVISONS NEEDED AT INSTRUCTORS DISCRETION\**

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Lecture | Monday Lab | Wednesday lab |
| 8/26-9/1 | Chapter 18 Endocrine | XXXXXXX | OSMOSIS/DIFFUSION  lab |
| 9/2-9/8 | **NO CLASS MON.**  **W:Quiz 1**  Chapter 18 Endocrine  Chapter 24 Digestive System | NO LAB  LABOR DAY | Endocrine Renal Lab |
| 9/9-9/15 | **M:Quiz 2**  Chapter 24 Digestive System | Endocrine Renal Lab | Dissection: Cat endocrine organs and GI organs  Wet lab: digestive system lab |
| 9/16-9/22 | **M:Quiz 3**  Chapter 24 Digestive System  Chapter 19 Blood | Dissection: Cat endocrine organs and GI organs  Wet lab: digestive system lab | Heart anatomy, blood flow (adult & fetal) & Heart Dissection |
| 9/23-9/29 | **M:Quiz 4**  Chapter 20 Heart | Heart anatomy, blood flow (adult & fetal) & Heart Dissection | **Practical #1**  Blood analysis |
| 9/30-10/6 | **M:Quiz 5**  Chapter 20 Heart | **Practical #1**  Blood analysis | RBC & WBC lecture and identification &  Human blood vessels |
| 10/7-10/13 | **M:UNIT TEST #1**  **(18, 24, 19, 20)**  W:Chapter 21  Blood Vessels | RBC & WBC lecture and identification &  Human blood vessels | Cat blood vessels |
| 10/14-10/20 | **W:** **Quiz # 6**  Chapter 22  Lymphatics and Immunity | Cat blood vessels | Human blood vessels &  Cat blood vessels |
| 10/21-10/27 | **M: Quiz #7**  Chapter 22  Lymphatics and Immunity  Chapter 23  The Respiratory System | Human blood vessels &  Cat blood vessels | **Practical 2**  ELISA |
| 10/28-11/3 | **M: Quiz #8**  Chapter 23  The Respiratory System | **Practical 2**  ELISA | Respiratory Anatomy  Respiratory Values lab  EKG |
| 11/4-11/10 | **M: Unit Test #2**  **(21, 22, 23)**  Chapter 26  Urinary System Chapter 27 Fluid, Electrolyte, and Acid–Base Balance | Respiratory Anatomy  Respiratory Values lab  EKG | Kidney dissection  Kidney anatomy  Nephron anatomy  Countercurrent exchange |
| 11/11-11/17 | **M:Quiz # 9**  Chapter 26  Urinary System Chapter 27 Fluid, Electrolyte, and Acid–Base Balance | Kidney dissection  Kidney anatomy  Nephron anatomy  Countercurrent exchange | Reproductive System Anatomy |
| 11/18-11/24 | **M:Quiz # 10**  Chapter 27 Fluid, Electrolyte, and Acid–Base Balance | Reproductive System Anatomy | Heredity and Genetics |
| 11/25-12/1  Thanksgiving | **M:Quiz #11**  Chapter 28 The Reproductive System | Heredity and Genetics | NO LAB |
| 12/2-12/8 | **M:Quiz #12**  Chapter 29 Development  **W:Unit Test #3** | **Practical #3** | **Practical #3** |
| 12/9-12/15 | M**:** Review for final  **W: Final Exam**  **11am-2pm** | **REVIEW SESSION CAFETERIA** | XXXXX |

Study Guide

## UNIT I

1. Anatomy and Physiology Defined
2. Subdivisions of anatomy and physiology
3. Terms of Location and Anatomical Position
4. Superior/Inferior
5. Anterior/Posterior
6. Ventral/Dorsal
7. Cranial/Caudal
8. Proximal/Distal
9. Internal/External
10. Peripheral/Deep
11. Medial
12. Lateral
13. Central
14. Parietal
15. Visceral
16. Fundamental Planes
17. Coronal or Frontal
18. Transverse or Horizontal
19. Sagittal
20. Medial
21. Lateral
22. Cavities
23. Ceolom
24. Thoracic
25. pericardial
26. pleural
27. Abdominal
28. Pelvic
29. Orbital
30. Nasal
31. Buccal
32. Organization of the body
33. Cells
34. Tissues
35. Organs
36. Systems
37. integumentary
38. skeletal
39. muscular
40. nervous
41. endocrine
42. circulatory
43. respiratory
44. digestive
45. excretory
46. reproductive
47. The movement of materials across the cell membrane
48. Diffusion
49. osmosis
50. dialysis
51. facilitated diffusion
52. Active transport
53. Endocytosis
54. pinocytosis
55. phagocytosis
56. Histology
57. Specialization of Cells (Tissues)
58. Structure and Function of the tissues
59. Epithelial
60. Connective
61. Muscular
62. Nervous
63. Membranes
64. Serous
65. Mucous
66. Cutaneous
67. Synovial
68. The Integumentary System
69. The skin and its tissues
70. Structure
71. Function
72. Appendages and Glands of the skin
73. Pigmentation

UNIT II

1. The Skeletal System
2. Types of bones cells and their functions
3. Osteoblasts
4. Osteoclasts
5. Osteocytes
6. The Bony Matrix
7. Types of Bone Tissue
8. Compact
9. Spongy
10. Membranes of Bone Tissue
11. Periosteum
12. Endosteum
13. Classification of Bones
14. Long
15. Short
16. Flat
17. Irregular
18. Sesamoid
19. Formation and Growth of Bones
20. Membranous Ossification
21. Endochondrial Ossification
22. Factors affecting bone growth and development
23. vitamins & minerals
24. hormones
25. physical exercise
26. The anatomy and physiology of fractures
27. Divisions of the Skeletal System and their Bones

1) Axial: 80 bones

2) Appendicular: 126 bones

1. pectoral girdle
2. pelvic girdle
3. Descriptive Terms
4. processes: process, condyle, tubercle, tuberosity, trochanter, crest, spine, head
5. cavities and depressions: groove, sinus, atrum, cornal, meatus, foramen, fissure

fovea, fossa

1. Arthrology: joints of articulation
2. Synarthroses (immovable joints)
3. synchrondoses
4. sutures
5. Amphiarthroses (slightly movable joints)
6. joints between the vertebrae
7. joints between the pubis and sacroiliac
8. Synovial-Diathrososes (free moving joints
9. ball and socket
10. hinge
11. pivot
12. condyloid
13. gliding
14. saddle
15. Movements permitted by Diarthroses (synovial joints)
16. angular movements: flexion, extension, abduction, adduction, elevation,

depression

1. circumduction
2. rotation
3. Special movements:
4. supination
5. pronation
6. inversion
7. eversion
8. protration
9. retraction
10. Practical Terms Related to the Skeletal System
11. sprain
12. dislocation
13. bursitis
14. arthritis
15. osteomyelitis
16. kyphosis
17. lordosis
18. scoliosis
19. The Muscular System
20. Types, location and function of muscle tissue
21. smooth muscle
22. cardiac muscle
23. striated or skeletal muscle
24. Contraction of muscle tissue
25. Conditions of contraction
26. stimuli
27. response to stimuli
28. chemical changes
29. Types of contraction
30. The physiology of skeletal muscle contraction
31. Skeletal muscles
32. Naming
33. directions of fibers
34. location
35. size
36. number of origins
37. shape
38. origin and insertion (attachments)
39. action
40. Grouping
41. prime mover – antagoist
42. prime mover – synergist
43. Skeletal Muscles and Their Bony Levers
44. The principle action of skeletal muscles
45. flexor
46. extensor
47. abductor
48. adductor
49. levator
50. depressor
51. supinator
52. pronator
53. sphincter
54. tensor
55. rotator

## UNIT III

1. The Nervous System
2. The function of the Nervous System
3. The organs of the Nervous System
4. Brain
5. Spinal cord
6. Membranes
7. Nerve cords
8. Ganglion
9. Nerve nucleus
10. The Cells and Tissues of the Nervous System
11. Supportive tissues and their function
12. neuroglia cells
13. astrocytes
14. oligodendrocytes
15. microglia cells
16. ependyma
17. The Neuron
18. anatomy
19. nerve cell body
20. nissl bodies (chromtophilic substances)
21. dendrites
22. axons
23. axoplasm
24. axolemma
25. neurolemmacytes (Schwann cells)
26. function of neurons
27. types of neurons
28. unipolar
29. bipolar
30. multiopolar
31. sensory
32. association – connection-interneuron
33. motor
34. Nerve Impulse transmission
35. The Synapse and Impulse Transmission
36. Nerve Regeneration
37. The Function (behavior) Unit of the Nervous System
38. The relex arc
39. composition
40. types

2. The Divisions of the Nervous system

1. The Central Nervous System
2. Membranes
3. The spinal cord
4. structure
5. functions
6. pathways
7. ascending tracts
8. fasciculus gracilis
9. fasciculus cuneatus
10. spinothalamic (lateral and anterior)

2) descending tracts

1. corticospinal
2. reticulospinal
3. rubrospinal tracts

d) spinal cord injuries

1. spinal shock
2. paralysis
3. flaccid paralysis
4. spastic paralysis
5. The Brain
6. structural make-up
7. lobes
8. organization
9. cerebrum
10. ventricles
11. thalamus
12. hypothalamus
13. limbic system
14. pineal gland
15. pons
16. medulla oblongata
17. cerebellum
18. functions
19. The Peripheral Nervous System
20. The cranial nerves
21. location
22. function
23. The spinal nerves
24. location
25. function
26. The Autonomic Nervous System
27. Sympathetic division
28. Parasympathetic division
29. Autonomic transmitters
30. Clinical terms related to the Nervous System
31. Somatic and Special Senses
32. Receptors
33. Types

a) mechanical

1. free-nerve (dendritic) ending
2. meissner’s corpuscles
3. merkel’s disks
4. pacinian corpuscles
5. hair cells
6. barorecptors
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

1. The Sense of smell
2. Olfactory cells and their function
3. The Sense of Taste
4. Taste Buds and their function
5. The Ear
6. structural makeup
7. physiology of hearing
8. equilibrium
9. static
10. dynamic
11. The Eye
12. structural makeup
13. physiology of sight
14. common disorders