1. **COURSE TITLE\*:** Anatomy and Physiology I
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: BIOL 1510**
3. **PREREQUISITE(S)\*: None**  **COREQUISITE(S)\*: None**
4. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 4 LECTURE HOURS\*: 3**

 **LABORATORY HOURS\*: 1 (3 contact hours) OBSERVATION HOURS\*:**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

This course introduces major topics in anatomy and physiology for allied health students. After an introduction to the complete structural hierarchy of the human body as well as the basic physiology of homeostasis, there is focus on the chemical, cellular, and tissue levels of organization. The course is then organized to examine the structure and function of organ systems including the integumentary system, skeletal system and articulations, muscular system, and the nervous system including general and special senses. The laboratory part of the course introduces students to techniques and equipment used to study human anatomy and physiology. The early labs address laboratory safety, the basic structure and functions of the human body, principles of scientific method, and the use of the metric system to make measurements useful in the study of anatomy and physiology. The next few labs focus on cells from chemical composition to membrane function, including microscopic examination of cell structures, mitosis, and tissues. The course then shifts to examine the structure and function of organ systems including the integumentary system, skeletal system and articulations, muscular system, and the nervous system including general and special senses.

1. **LEARNING OUTCOMES\*:**

This course is designed to ensure the student will be able to:

I. Recognize the body plan and organization of the human body.

1. Describe the human body in anatomical position.
2. Identify and define the anatomic planes in which a body might be viewed.
3. List and describe the location of the major anatomical cavities and regions of the body.
4. Describe the location of structures of the body, using basic regional and systemic terminology.
5. Define the terms anatomy and physiology.
6. List the levels of organization of the human body and give an example of each level.
7. List the organ systems of the human body, their major components, and describe the major functions of each.

II. Define and describe Homeostasis.

1. Define homeostasis and explain its importance to survival.
2. Describe a homeostatic mechanism and compare and contrast positive and negative feedback in terms of the relationship between stimulus and response.

III. Recognize the basic principles of chemistry and cell biology.

1. Compare and contrast basic chemistry terms including atom, element, molecule, compound, ion, electrolyte, free radical, isotope, and radioisotope.
2. Compare and contrast ionic bonds, nonpolar covalent bonds, polar covalent bonds, and hydrogen bonds.
3. List and describe the physiologically important properties of inorganic molecules including water; mixtures (solutions, colloids, suspensions; and emulsions); salts and electrolytes; acid, base, pH, and buffer.
4. Define the term organic molecule and compare and contrast the general molecular structure and physiologic functions of carbohydrates, lipids, proteins, and nucleic acids.
5. Describe the generalized reversible reaction for ATP synthesis and the release of energy from ATP.
6. List and recognize the three main parts of a cell (plasma membrane, cytoplasm, and nucleus), and explain the general functions of each part.
7. Describe the chemical composition, general structure (i.e., fluid mosaic model), properties, and functions of all cellular membranes.
8. Compare and contrast mechanisms for movement across cell membranes including osmosis, simple diffusion, facilitated diffusion, exocytosis, endocytosis, phagocytosis, pinocytosis, and the effects of hypertonic, isotonic, and hypotonic solutions on cells.
9. Define resting membrane potential (RMP) and recognize the role of ion concentration gradients and membrane permeability to ions established by leakage channels and sodium-potassium ATPase pumps.
10. Describe the structure and function of the cytoskeleton and various cellular organelles.
11. Recognize elements of the molecular chain of command including the terms genetic code, DNA replication, transcription (of RNA), and translation (of protein).
12. Recognize the steps of cellular respiration by which glucose is converted through metabolic pathways to carbon dioxide and water (e.g., glycolysis, citric acid [Krebs or tricarboxylic acid] cycle, electron transport chain).
13. List the general phases (e.g., G phases, S phase, cellular division) of the cell cycle including the processes of mitosis and cytokinesis.

IV. Recognize and differentiate select human tissues and their functions.

1. Define the term histology and compare and contrast the general features of the four major tissue types.
2. Recognize the microscopic anatomy, location, and function of each epithelial tissue type including the different kinds of exocrine glands.
3. Classify different types of connective tissues based on their structural characteristics, functions, and locations in the body.
4. Classify different types of muscle tissue based on structural characteristics, functions, and locations in the body.
5. Compare and contrast neurons and glial cells with respect to cell structure and function.
6. Describe the structure and function of mucous, serous, cutaneous, and synovial membranes.
7. Compare and contrast the types of intercellular connections (cell junctions) with respect to structure and function.
8. Describe tissue repair following an injury.
9. Define the following terms: hypertrophy, hyperplasia, atrophy, necrosis, apoptosis, metaplasia, regeneration, fibrosis, and dysplasia.

V. Recognize and describe select structures and functions of the integumentary system.

1. List the components and general functions of the integumentary system and the subcutaneous layer.
2. Identify and describe the layers of the epidermis, dermis, and subcutaneous layer indicating which are found in thin skin and which are found in thick skin.
3. Describe the functions of the epidermis, subcutaneous layer, and dermis, including the specific function of each dermal layer.
4. Describe the structure and function of hair, nails, and exocrine glands of the integumentary system.
5. Explain how the integumentary system relates to other body systems to maintain homeostasis including thermoregulation and water conservation.
6. Given a factor or situation (e.g., second-degree burns [partial-thickness burns]), predict the changes that could occur in the integumentary system and the consequences of those changes (i.e., given a cause, state a possible effect).

VI. Recognize and describe select structures and functions of the skeletal system and joints.

1. Describe the major functions of the skeletal system.
2. List and describe the cellular and extracellular components of bone.
3. Classify bones of the skeleton based on their shape and identify and describe the structural components of a long bone.
4. Compare and contrast intramembranous and endochondral (intracartilagenous) bone formation.
5. Compare and contrast the function of osteoblasts and osteoclasts during bone growth, repair, and remodeling.
6. Distinguish between the axial and appendicular skeletons and list the major bones contained within each.
7. Describe the anatomical and functional classification of joints based on structure: fibrous (i.e., gomphosis, suture, syndesmosis), cartilaginous (i.e., symphysis, synchondrosis), and synovial (i.e., planar/gliding, hinge, pivot, condylar, saddle, ball-and-socket), and provide examples of each type.
8. Explain how the skeletal system participates in homeostasis of plasma calcium levels.
9. Given a factor or situation (e.g., osteoporosis), predict the changes that could occur in the skeletal system and the consequences of those changes (i.e., given a cause, state a possible effect).

VII. Recognize and describe select structures and functions of the muscular system.

1. Describe the major functions of muscle tissue.
2. Describe the structure, location in the body, and function of skeletal, cardiac, and smooth muscle.
3. Describe the organization of skeletal muscle, from cell (skeletal muscle fiber) to whole muscle.
4. Describe the sequence of events involved in the contraction of a skeletal muscle fiber, including events at the neuromuscular junction, excitation-contraction coupling, cross-bridge cycling, and relaxation.
5. Describe the sources of ATP (e.g., glycolysis, oxidative phosphorylation, creatine phosphate) that muscle fibers use for skeletal muscle contraction.
6. Compare and contrast the anatomical and metabolic characteristics of slow oxidative (Type I), fast oxidative (Type IIa, intermediate, or fast twitch oxidative glycolytic), and fast glycolytic (Type IIb/IIx or fast twitch anaerobic) skeletal muscle fibers.
7. Define the following terms: tension, contraction, twitch, motor unit, and and interpret a myogram of tension versus stimulus frequency to explain the physiological basis for the phenomena of treppe, summation, tetanus, the phenomenon of recruitment.
8. Explain how the name of a muscle can help identify its action, appearance, or location.
9. Identify the location, general attachments, and actions of the major skeletal muscles.
10. Describe similar actions (functional groupings) of muscles in a particular compartment (e.g., anterior arm) or region (e.g., deep back) and distinguish prime mover (agonist), antagonist, synergist, and fixator.
11. Compare and contrast the classes of levers in terms of the relative position of fulcrum, effort, and load, and describe examples of each in the human body (comparisons may include relative power and range of motion).
12. Compare the signals that initiate smooth muscle contraction to the signal that initiates skeletal muscle contraction.
13. Explain how the muscular system contributes to thermoregulation.
14. Given a factor or situation (e.g., muscular dystrophy), predict the changes that could occur in the muscular system and the consequences of those changes (i.e., given a cause, state a possible effect).

VII. Recognize and describe select structures and functions of the nervous system.

1. Describe the general functions of the nervous system.
2. Compare and contrast the central nervous system (CNS) and the peripheral nervous system (PNS) with respect to structure and function including differentiating between the sensory (afferent), control (integrating) center, and motor (efferent) and components.
3. Compare and contrast the somatic motor and autonomic motor divisions of the nervous system.
4. Describe the protective roles of the cranial bones, vertebral column, meninges, and cerebrospinal fluid (CSF).
5. Identify and describe the major components of a typical neuron (e.g., cell body, dendrites, axon hillock, and axon) and compare and contrast the three functional types of neurons (i.e., sensory [afferent] neurons, interneurons [association neurons], and motor [efferent] neurons) with respect to their structure, location, and function.
6. Describe the structure, location, and function of each of the six types of neuroglial (glial) cells and compare and contrast how myelination occurs in the CNS and PNS.
7. Describe the physiological basis of resting membrane potential (RMP), graded potentials, and action potentials in a neuron including the ion channels involved, the relative ion concentrations and movements involved in depolarization, threshold, repolarization, hyperpolarization, absolute and relative refractory periods, and conduction (propagation) of an action potential.
8. Describe the structure of a typical chemical synapse, events of synaptic transmission in order from the release of neurotransmitter by synaptic vesicles to the effect of the neurotransmitter on the postsynaptic cell, the role of neuromodulator, and the different mechanisms by which neurotransmitter activity at a synapse can be terminated (e.g., reuptake, enzymatic breakdown, diffusion).
9. Define excitatory postsynaptic potential (EPSP) and inhibitory postsynaptic potential (IPSP) in neuronal circuits and explain temporal and spatial summation of postsynaptic potentials with respect to common excitatory and inhibitory neurotransmitter(s) used in the nervous system.
10. Identify and describe the structural and functional organization of the four major parts of the adult brain (i.e., cerebrum, diencephalon, brainstem, cerebellum) as well as the major structures of each part.
11. List and identify the cranial nerves by name, number, and function.
12. Identify and describe the structural and functional organization of the spinal cord, including its enlargements and features seen in a cross-sectional view such as gray matter horns and ascending and descending white matter tracts.
13. List the spinal nerve pairs emerging from each spinal cord region, describe the structure and function of the ventral and dorsal roots and dorsal root ganglia, and identify and describe the formation, structure, and branches of a typical spinal nerve including the cervical, brachial, lumbar, and sacral nerve plexuses.
14. Define the term reflex and name all components of each reflex arc: stretch reflex, (Golgi) tendon reflex, flexor (withdrawal) reflex, crossed-extensor reflex, and visceral reflex arcs.
15. Describe the locations and functions of the first-, second- and third-order neurons in a sensory pathway, the concept of decussation and its functional implications, and the locations and functions of the upper and lower motor neurons in a motor pathway.
16. Name the two main divisions of the ANS and compare and contrast the major functions of each division, their neurotransmitters, the origination of the division in the CNS, the location of their preganglionic and postganglionic (ganglionic) cell bodies, the length of the preganglionic versus postganglionic axons, cholinergic and adrenergic receptors with respect to neurotransmitters that bind to them, receptor subtypes, receptor locations, target cell response (i.e., excitatory or inhibitory), and the effects (or lack thereof) of sympathetic and parasympathetic innervation on various effectors (e.g., heart, airways, gastrointestinal tract, iris of the eye, blood vessels, sweat glands, arrector pili muscles).
17. Explain the role of the nervous system in the maintenance of homeostasis and give examples of how the nervous system interacts with other body systems to accomplish this.
18. Given a factor or situation (e.g., a demyelinating disease), predict the changes that could occur in the nervous system and the consequences of those changes (i.e., given a cause, state a possible effect).

IX. Recognize and describe select structures and functions of the general and special senses

1. Compare and contrast a general sense receptor and a special sense (complex) receptor with respect to transduction, perception, sensation, tonic and phasic receptors, and adaptation.
2. Compare and contrast the location, structure, and function of the different types of tactile receptors (e.g., tactile [Merkel] corpuscle, lamellated [Pacinian] corpuscle).
3. Identify and describe the gross and microscopic anatomy of the eye, trace the path of light as is passes through the eye to the retina, and describe which structures are responsible for refracting the light rays.
4. Describe phototransduction in rods and cones and trace the signal pathway from the retina through the optic nerve, optic chiasm, optic tract, and to the various parts of the brain.
5. Trace the path of olfaction from the olfactory receptors, to the initiation of an action potential in the olfactory nerves, through the olfactory bulb, the olfactory tract, and to the various parts of the brain for processing.
6. Trace the path of gustation from gustatory receptors through specific cranial nerves to various parts of the brain for processing.
7. Identify the macroscopic and microscopic structures of the outer (external), middle, and inner (internal) ear and their major components (e.g., auditory ossicles, auditory [pharyngotympanic] tube), and describe the structure and function of each.
8. Trace the path of sound from the external ear to the inner ear, including action potential generation the signal pathway from the spiral organ (of Corti) to the cochlear branch of the vestibulocochlear nerve (CN VIII) and to the various parts of the brain.
9. Compare and contrast static and dynamic equilibrium including receptors and action potential generation along with the signal pathway from the maculae and cristae ampullares to the vestibular branch of the vestibulocochlear nerve (CN VIII) and to the various parts of the brain.
10. Explain how the sense organs relate to other body organs and systems to maintain homeostasis.
11. Given a factor or situation (e.g., macular degeneration), predict the changes that could occur in the affected sense and the consequences of those changes (i.e., given a cause, state a possible effect).

Lab Outcomes

1. Recognize and apply rules and behaviors of laboratory safety.
2. Locate and identify anatomical structures and recognize basic physiological processes.
3. List and apply the steps of the scientific method.
4. Make measurements of length, volume, weight, pressure, and other common properties using the metric system and other appropriate scales including pH.
5. Properly use standard laboratory equipment including general lab ware, microscopes, thermocyclers, dissection tools, and other instruments and techniques.
6. Work collaboratively to perform and interpret experiments.
7. Collect and tabulate data, perform data analyses, and prepare and interpret graphs and charts to demonstrate quantitative and empirical reasoning.
8. Use critical thinking and problem-solving skills to perform and interpret experimental results.
9. Produce effective written, oral, and visual communication.
10. **ADOPTED TEXT(S)\*:**

*Human Anatomy and Physiology with MasteringA&P*

11th edition

Marieb and Hoehn

Pearson/Benjamin Cummings, 2019

ISBN: 978-0-13-678105-9 (includes Inclusive Access E-text and Mastering Access).

ISBN: 978-0-13-480735-5 (includes Inclusive Access E-text but no Mastering Access).

ISBN for students not wanting Inclusive Access: 978-0-13-517504-0 (includes Mastering and E-text).

And

*Laboratory Manual for Human Anatomy & Physiology: A Hands-On Approach, Pig Version*

1st edition

Greene, M.L., R.H. Robinson, and L.C. Strong

Pearson Education, Inc., 2021

ISBN: 978-0-13-566591-6 (includes Inclusive Access E-text and Mastering Access).

ISBN for students not wanting Inclusive Access: 978-0-13-547369-6 (includes Mastering and E-text).

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.) \*\***

It is required to have publisher’s supplemental materials that accompany the text including Mastering A&P. It might also be helpful to download and install Microsoft Office products, which can be obtained from the SSCC website at no cost, including Microsoft Word, Excel, and PowerPoint.

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: 0 – 59

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

**Grades will be based on (example, varies by instructor):**

Assignments 200 points 20%

Review Quizzes 100 points 10%

3 Exams (@ 100 points each, drop low score) 200 points 20%

Weekly Lab Activity 150 points 15%

Lab Exams (@ 100 points each, drop low score) 100 points 10%

Written Lab Reports (2 @ 50 pts each) 100 points 10%

Comprehensive Exam 150 points 15%

Total 1000 points 100%

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

This course may use face-to-face or recorded lecture, PowerPoint presentations, videos, in-class or online Discussions, chapter reading and writing assignments, individual or group projects, research papers, primary scientific literature, and online assignments, quizzes, and other activities. Both written and online quizzes, tests and exams may be used as appropriate to assess the course objectives. The hands-on portion of the lab course covers the modern concepts of the chemical and cellular bases of life. During the course, students will demonstrate the application of the methods and tools of scientific inquiry, by actively collecting data; manipulating data; analyzing data; preparing tables and charts; interpreting data; presenting findings; and using information to answer questions. Students will interact with the instructor at several points during each lab activity and will receive synchronous feedback following proper laboratory safety protocol. Laboratory exercises emphasize experimental design and critical thinking.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning outcomes tied to assignments / topics.)***

Week 1: Body Plan and Organization with Homeostasis

Week 2: Chemical Basis of Life

Week 3: Cell Biology

Week 4: Cellular Metabolism and Cell Cycle

Week 5: Tissues

Week 6: Integumentary System

Week 7: Skeletal System

Week 8: Joints

Week 9: Muscle Tissue

Week 10: Muscular System

Week 11: Nervous Tissue

Week 12: Central Nervous System

Week 13: Peripheral Nervous System

Week 14: Autonomic Nervous System

Week 15: General and Special Senses

**Sample Course Calendar (example, may vary by instructor)**

| **Exercise** | **Where to Find:** | **Points** | **Due Date** | **Learning Outcomes** |
| --- | --- | --- | --- | --- |
| Introduction to Mastering A&P  | Mastering (13 min.) | 2 | Week 1 | Orientation |
| Chapter 1 Reading Activity | Mastering (27 min.) | 3.9 | Week 1 | 1-9 |
| Chapter 2 Reading Activity  | Mastering (36 min.) | 3.5 | Week 2 | 10-14 |
| Chapter 3 Reading Activity Part 1: Membranes | Mastering (84 min.) | 4 | Week 3 | 15-18 |
| Chapter 3 Reading Activity Part 2: Organelles | Mastering (42 min.) | 5.7 | Week 3 | 19 |
| Chapter 3 Reading Activity Part 3: Metabolism | Mastering (41 min.) | 3.7 | Week 4 | 20-22 |
| Gene Expression Assignment | Handout (in class) | 5 | Week 4 | 20 |
| Chapter 4 Reading Activity | Mastering (15 min.) | 2.8 | Week 5 | 23-31 |
| Chapter 1 Review Quiz | Mastering (6 min.) | 2 | Week 5 | 1-9 |
| Chapter 2 Review Quiz | Mastering (7 min.) | 2 | Week 5 | 10-14 |
| Chapter 3 Review Quiz | Mastering (5 min.) | 2 | Week 5 | 15-22 |
| Chapter 4 Review Quiz | Mastering (6 min.) | 2 | Week 5 | 23-31 |
| Exam 1 | Mastering (30 min.) | 10 | Week 6 | 1-31 |
| Chapter 5 Reading Activity | Mastering (46 min.) | 5.2 | Week 6 | 32-37 |
| Chapter 6 Reading Activity | Mastering (46 min.) | 3.5 | Week 7 | 38-42 |
| Chapter 7 Reading Activity | Mastering (28 min.) | 10.0 | Week 7 | 43 |
| Chapter 8 Reading Activity | Mastering (28 min.) | 10.0 | Week 8 | 44-46 |
| Chapter 9 Reading Activity | Mastering (41 min.) | 4.7 | Week 9 | 47-53 |
| Chapter 10 Reading Activity | Mastering (44 min.) | 18.7 | Week 9 | 54-60 |
| Muscle and Joint Movies | Mastering (61 min.) | 14.2 | Week 9 | 44-60 |
| Chapter 5 Review Quiz | Mastering (5 min) | 2 | Week 10 | 32-37 |
| Chapter 6 Review Quiz | Mastering (5 min) | 2 | Week 10 | 38-46 |
| Chapter 7 Review Quiz | Mastering (4 min.) | 2 | Week 10 | 43 |
| Chapter 8 Review Quiz | Mastering (5 min.) | 2 | Week 10 | 44-46 |
| Chapter 9 Review Quiz | Mastering (6 min.) | 2 | Week 10 | 47-53 |
| Chapter 10 Review Quiz | Mastering (5 min.) | 2 | Week 10 | 54-60 |
| Exam 2 | Mastering (30 min.) | 10 | Week 10 | 32-60 |
| Chapter 11 Reading Activity | Mastering (31 min.) | 4.8 | Week 11 | 61-69 |
| Chapter 12 Reading Activity | Mastering (23 min.) | 6.6 | Week 12 | 70, 72, 77, 78 |
| Chapter 13 Reading Activity | Mastering (29 min.) | 6.6 | Week 12 | 71, 73-75, 78 |
| Chapter 14 Reading Activity | Mastering (17 min.) | 4.9 | Week 13 | 76-77 |
| Chapter 15 Reading Activity | Mastering (34 min.) | 16.1 | Week 14 | 79-89 |
| Chapter 11 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 61-69 |
| Chapter 12 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 70, 72, 77, 78 |
| Chapter 13 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 71, 73-75, 78 |
| Chapter 14 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 76-77 |
| Chapter 15 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 79-89 |
| Exam 3 | Mastering (30 min.) | 10 | Week 15 | 61-89 |
| Comprehensive Exam | Mastering (45 min) | 100 | Week 16 | 1-89 |

**Sample lab outline (Lab Exercises are in the Lab Manual):**

Week 1, Lab Exercise 1: Introduction to Anatomy and Physiology (Lab Learning Outcomes (LO) 90, 91, 92, 93, 95, 96, 97)

Lab safety protocols (LO 90), scientific method (LO 92) and metric measurements (LO 92, 93, 94, 95, 96, 97), and human body systems (LO 91)

Week 2, Lab Exercise 1: Introduction to Anatomy and Physiology (LO 91, 90, 92, 93)

Human body systems, anatomical position, regional terminology, planes of section, body cavities, abdominopelvic regions, and serous membranes (all LO 91)

Week 3, Lab Exercise 2: Chemistry of Life (LOs 90 - 98)

Periodic table and chemical bonds (LO 2), enzymes (LO 90, 91, 92, 94, 95, 96, 97) including a written Lab Report on urease activity (LO 92, 98), pH scale (LO 91, 93), and identification of organic molecules (LO 91, 93)

Week 4, Lab Exercise 3: The Cell (LO 91, 93, 94, 95, 96, 97)

Microscopy (LO 91, 93, 94), cell structure (LO 91, 94), membrane function (LO 91, 95, 96, 97), and the cell cycle (LO 91)

Week 5, Handout: PCR and analysis of nucleic acid structure and function (LO 90 - 98)

Use a Thermocycler and perform PCR (LO 90 - 97), and produce a written Lab Report on application of PCR (LO 98)

Week 6, Lab Exercise 4: Histology (LO 91, 94)

Microscopy (LO 94) and identification of epithelial, connective, muscle, and nervous tissue (LO 91)

Week 7, Lab Exercise 5: Integumentary system (LO 91, 94)

Skin (LO 91), fingerprints (LO 91), and accessory structures (LO 91)

Week 8, Lab Exercises 6 and 7: Bone Tissue and Skeletal System (LO 91, 94)

Gross anatomy of bone (LO 91), microscopic structure of bone (LO 91, 94), and identification of bones and select bone structures (LO 91)

Week 9, Lab Exercises 7 and 8: Skeletal System and Articulations (LO 91)

Identification of bone and select bone structures (LO 91), classification of joints (LO 91), synovial joints including the knee, elbow, shoulder, and hip (LO91), and list the common joint movements (LO 91)

Week 10, Lab Exercise 9: Muscular System (LO 91)

Identify characteristics of skeletal muscles (LO 91) and identify select skeletal muscles (LO 91)

Week 11, Lab Exercise 10: Muscle Tissue and Physiology (LO 91 - 97)

Perform microscopic identification of the three muscle types (LO 91, 94), identify intracellular structures of skeletal muscle fibers (LO 91), classify isotonic and isometric contractions (LO 91, 96), measure muscle fatigue (LO 91, 91, 93, 95, 96, 97)

Week 12, Lab Exercise 11: Nervous System and Nervous Tissue (LO 91, 92, 93, 94, 95, 96, 97)

Identification of neuron components and neuroglial cells (LO 91, 94), use a microscope to distinguish an electrical synapse (intercalated disk) from a chemical synapse (neuromuscular junction) (LO 91, 94), and use computer simulation to investigate nervous electrophysiology (LO 91, 92, 95, 96, 97)

Week 13, Lab Exercises 12 and 13: Nervous System Anatomy (with brain dissection) (LO 90, 91, 92, 93, 95, 96, 97)

The brain with dissection (LO 90, 91, 94), spinal cord (LO 91), cranial and spinal nerves (LO 91), testing cranial nerves (LO 91, 92, 95, 96, 97), and test skin receptive field and select reflexes (LO 91, 92, 95, 96, 97),

Week 14, Lab Exercise 14: Autonomic Nervous System and Homeostasis (LO 91, 93, 94, 95, 96, 97)

Identification of brain structures with dissection (LO 91, 94), anatomy of the spinal cord (LO 91), anatomy of the cranial and spinal nerves (LO 91), testing cranial nerves (LO 91, 92, 95, 96, 97), and test skin receptive field and select reflexes (LO 91, 94, 95, 96, 97),

Week 15, Lab Exercise 15: Senses (LO 91, 92, 93, 94, 95, 96, 97)

Anatomy of the special senses with dissection of the eye (LO 90, 91, 94), visual tests (LO 91, 94, 95), and hearing and equilibrium tests (LO 91, 92, 93, 94, 95, 96, 97),

**Sample Lab Course Calendar.**

Lab activities follow the procedures in the lab manual unless a handout is used as indicated. Quizzes are taken either in the classroom or online at the discretion of the instructor using Canvas or Mastering online quizzes.

| **Exercise** | **Where to Find:** | **Points** | **Due Date** | **Learning Outcomes** |
| --- | --- | --- | --- | --- |
| **Week 1** Exercise 1 Lab Activity: Introduction including lab safety, scientific method, metric system, and the human body | Lab Manual | 7 |  | 90, 91, 92, 93, 95, 96, 97 |
| **Week 2** lab safety, scientific method, and metric system quiz | Canvas or Mastering | 20 |  | 90, 92, 93 |
| **Week 2** Exercise 1 Lab Activity (continued): Introduction to the human body | Lab Manual | 6 |  | 91 |
| **Week 3** Anatomy of the human body quiz | Canvas or Mastering | 20 |  | 91 |
| **Week 3** Exercise 2 Lab Activity: Chemistry including enzymes, pH, and organic molecules | Lab Manual | 7 |  | 91 - 98 |
| **Week 4** Lab Report on urease activity (First Draft) | Handout | 10 |  | 98 |
| **Week 4** Exercise 3 Lab Activity: Microscopes and cells | Lab Manual | 7 |  | 91, 93, 94, 95, 96, 97 |
| **Week 5** Chemistry Quiz | Canvas or Mastering | 20 |  | 90, 91, 92, 93, 94 |
| **Week 5** Lab Report on Urease Activity (Second Draft) | Handout | 10 |  | 98 |
| **Week 5** PCR Lab Activity | Handout | 7 |  | 90 - 98 |
| **Week 6** Microscopy and Cells Quiz | Canvas or Mastering | 20 |  | 91, 94 |
| **Week 6** Final Lab Report on Urease Activity | Handout | 30 |  | 98 |
| **Week 6** Exercise 4 Lab Activity: Histology | Lab Manual | 6 |  | 91, 94 |
| **Week 7** Tissues Quiz | Canvas or Mastering | 20 |  | 91, 94 |
| **Week 7** Lab Report on PCR and Electrophoresis Activity (First Draft) | Handout | 10 |  | 98 |
| **Week 7** Exercise 5 Lab Activity: Integumentary system | Lab Manual | 6 |  | 91, 94 |
| **Week 8** Integumentary System Quiz | Canvas or Mastering | 20 |  | 91, 94 |
| **Week 8** Lab Report on PCR and Electrophoresis Activity (Second Draft) | Handout | 10 |  | 98 |
| **Week 8** Exercises 6 & 7 Lab Activity: Bone tissue and bones of the skeletal system | Lab Manual | 7 |  | 91, 94 |
| **Week 9** Final Lab Report on the PCR and Electrophoresis Activity | Handout | 30 |  | 98 |
| **Week 9** Exercises 7 & 8 Lab Activity: Skeletal system and articulations | Lab Manual | 7 |  | 91 |
| **Week 10** Skeletal System Quiz | Canvas or Mastering | 20 |  | 91, 94 |
| **Week 10** Exercise 9 Lab Activity: Muscular system | Lab Manual | 7 |  | 91 |
| **Week 11** Knee and Joints Quiz | Canvas or Mastering | 20 |  | 91, 94 |
| **Week 11** Exercise 10 Lab Activity: Muscle tissue and physiology | Lab Manual | 7 |  | 2, 3, 4, 5, 6, 7, 8 |
| **Week 12** Exercise 11 Lab Activity: Nervous tissue | Lab Manual | 7 |  | 2, 3, 4, 5, 6, 7, 8 |
| **Week 13** Muscular System Quiz | Canvas or Mastering | 20 |  | 91, 94 |
| **Week 13** Exercises 12 and 13 Lab Activity: Central and peripheral nervous system | Lab Manual | 7 |  | 90, 91, 92, 93, 95, 96, 97 |
| **Week 14** Exercise 14 Lab Activity: Pre-Autonomic nervous system and homeostasis) | Lab Manual | 6 |  | 91, 92, 93, 94, 95, 96, 97 |
| **Week 15** Nervous System Quiz | Canvas or Mastering | 20 |  | 90 - 98 |
| **Week 15** Exercise 15 Lab Activity: Senses | Lab Manual | 6 |  | 90 - 97 |

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

Final grade in this course will be determined by mastery of course material as assessed by quizzes, tests, exams, and other assignments.

**16. FERPA: \***

Students need to understand that their work may be seen by others. Others may see students’ work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that their work may be submitted to other entities for the purpose of plagiarism checks.

**17. ACCOMMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.