1. **COURSE TITLE\*:** Anatomy and Physiology II
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: BIOL 1520**
3. **PREREQUISITE(S)\*:** BIOL 1510  **COREQUISITE(S)\*:**
4. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 4 LECTURE HOURS\*: 3**

**LABORATORY HOURS\*: 1 (2 contact hours) OBSERVATION HOURS\*:**

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

This course is a continuation of the study of major topics in anatomy and physiology begun in Biol 1510 Anatomy and Physiology I. The course begins with the structures and functions of the endocrine system that provide relatively slow and long-term hormonal controls. The reproductive system, development, and genetics of humans are also covered. The structure and function of the cardiovascular and lymphatic systems including immunity are included in the middle of the course. The final part of the course covers the respiratory, digestive, and urinary systems along with nutrition and body balances. The laboratory component of this course introduces students to techniques and equipment used to study human anatomy and physiology. The first lab is an examination of endocrine system anatomy as well as the major hormones and their functions. The next labs focus on the relationship between structure and function of the reproductive system, the process of human development, and pregnancy. We then perform several types of blood tests, examine the heart including the use of dissection, and identify select blood vessels. The lymphatic system and immunity are examined next. Dissection of the fetal pig follows to introduce the respiratory, digestive, and urinary systems. The final labs take a deeper look at these organ systems.

1. **LEARNING OUTCOMES\*:**

This course is designed to at the completion students will be able to:

X. Recognize and describe select structures and functions of the endocrine system.

1. Describe the major functions of the endocrine system and define the terms hormone, endocrine gland, endocrine tissue (organ), and target cell.
2. Compare and contrast how steroid and peptide hormones are produced and stored in the endocrine cell, released from the endocrine cell, transported in the blood, and interact with target cell receptors.
3. Describe the various signals that initiate hormone production and secretion (e.g., monitored variables, direct innervation, neurohormones, other hormones).
4. Describe the locations, anatomical relationships, major hormones secreted, and their primary target(s) and effects of the hypothalamus, anterior pituitary, and posterior pituitary, including the hypothalamic-hypophyseal portal system.
5. Describe the anatomy, location, major hormones secreted, control pathway(s) for hormone secretion, and hormone primary targets and effects for the thyroid gland, parathyroid glands, thymus gland pancreas, and adrenal cortex.
6. Define the terms paracrine and autocrine.
7. Describe the general adaptation syndrome in response to stress including the hormones released and their actions during short-term and long-term stress.
8. Describe examples of how the endocrine organs interact with other body organs and systems to maintain homeostasis.
9. Given a factor or situation (e.g., lack of iodine in the diet), predict the changes that could occur in the endocrine system and the consequences of those changes (i.e., given a cause, state a possible effect).

XI. Recognize and describe select structures and functions of the cardiovascular system.

1. Describe the major functions of each component of the cardiovascular system (i.e., blood, heart, blood vessels).
2. Describe the general composition of blood including plasma, formed elements, and the structure and function of hemoglobin and its breakdown products.
3. Describe the locations of hematopoiesis (hemopoiesis) and the significance of the hematopoietic stem cell (HSC) or hemocytoblast.
4. Describe the process of hemostasis including the vascular phase and the role of endothelial cells, the role of platelets and platelet plugs, the basic steps of coagulation and the role of positive feedback loops, and the process of fibrinolysis.
5. List the type of antigen and the type of antibodies present in each ABO blood type, describe the Rh antigen, and predict which blood types are compatible in transfusion.
6. Identify and describe the structure and function of the main external and internal structures of the heart including chambers, layers of the heart wall, septa, valves, papillary muscles, chordae tendineae, fibrous skeleton, major veins and arteries.
7. Trace the path of blood through the right and left sides of the heart, including its passage through the heart valves, and indicate whether the blood is oxygen-rich or oxygen-poor.
8. List the parts of the electrical conduction system of the heart in the correct sequence; compare and contrast the initiation of action potentials in cardiac autorhythmic cells, cardiac contractile cells, and skeletal muscle cells and recognize that the SA node normally paces the heart, the waveforms in a normal electrocardiogram (ECG) and the electrical events represented by each waveform.
9. Define cardiac cycle and recognize its phases and characteristics including ventricular filling, isovolumetric contraction, ventricular ejection, isovolumetric relaxation, electrocardiogram (ECG), heart valve operation and heart sounds, and pressure changes in the heart chambers and the great vessels.
10. Recognize the Frank-Starling Law of the heart and the role of the autonomic nervous system in the regulation of cardiac output (CO), venous return, preload, afterload, end diastolic volume (EDV), end systolic volume (ESV), and stroke volume (SV).
11. Compare and contrast arteries, capillaries, and veins in term of tunic thickness, composition, lumen diameter, and presence of valves, and define vasoconstriction and vasodilation and identify the major arteries and veins involved, and explain the functional significance of the systemic and pulmonary circuits.
12. Trace the pathway of blood flow from the placenta, through the fetal heart and body, and back to the placenta.
13. Compare and contrast the mechanisms that regulate blood flow and blood pressure including arterial radius and length, the role of arterioles and myogenic autoregulation, autonomic regulation, local hormone and neural factors that affect peripheral resistance and the role of muscular compression and the respiratory pump aid in venous return.
14. Explain the mechanisms of capillary exchange of gases, nutrients, and wastes including the forces that create capillary filtration and reabsorption.
15. Provide specific examples to demonstrate how the cardiovascular system maintains blood pressure homeostasis in the body.
16. Given a disruption in the structure or function of the cardiovascular system (e.g., pulmonary edema), predict the possible factors or situations that might have created that disruption (i.e., given an effect, predict possible causes).

XII. Recognize and describe select structures and functions of the lymphatic system and immunity.

1. Describe the major functions of the lymphatic system.
2. Compare and contrast lymphatic vessels and lymph with blood vessels and blood in terms of structure and function.
3. Describe the structure, function, and major locations of lymphatic nodules and organs including lymph nodes, tonsils, thymus, spleen, and mucosa-associated lymphatic tissue (MALT).
4. Compare and contrast major types of bacterial, eukaryotic, and viral pathogens.
5. Compare and contrast innate (nonspecific) with adaptive (specific) defenses.
6. Describe forms of innate immunity including surface membrane barriers, phagocytosis and important phagocytic cells, natural killer cells, complement, interferon and other antimicrobial chemicals, inflammation, and fever.
7. Compare and contrast antibody-mediated (humoral) and cell-mediated (cellular) immunity and describe the immunological memory (anamnestic) response.
8. Define antigen, self-antigen, and antigen receptor and distinguish among complete antigens, haptens, antigenic determinants, and self-antigens.
9. Describe where class I and class II major histocompatibility complex (MHC) proteins are found, explain their functions in adaptive immunity, and provide examples of cells that function as antigen-presenting cells (APCs).
10. Compare and contrast the defense mechanisms and functions of B and T cells including the general structure and functions of helper T cells, cytotoxic T cells, regulatory [suppressor] T cells, B cells, plasma cells, and mechanisms of antigen challenge and the clonal selection.
11. Compare and contrast the structure and functions of the classes of antibodies and interpret a graph of the primary and secondary immune response over time.
12. Distinguish between active and passive immunity and provide examples of natural and artificial examples of both.
13. Provide specific examples to demonstrate how the lymphatic system responds to maintain homeostasis in coordination with other body systems.
14. Given a disruption in the structure or function of the lymphatic or immune system (e.g., destruction of helper T-cells), predict the possible factors or situations that might have caused that disruption (i.e., given an effect, predict the possible causes).

XIII. Recognize and describe select structures and functions of the respiratory system.

1. Describe the major functions of the respiratory system.
2. List, in order, the respiratory structures that air passes through during inspiration and expiration and recognize the major functions of the structures in the conducting and respiratory zones including the nasal cavity, paranasal sinuses, pharynx, larynx, trachea, bronchial tree, alveolar ducts, alveolar sacs, and alveoli.
3. List the muscles used in pulmonary ventilation and recognize descriptions of intrapleural pressure, transpulmonary pressure, intrapulmonary pressure, Boyle’s Law, bronchoconstriction, ventilation-perfusion coupling, lung and thoracic wall compliance, pulmonary surfactant and alveolar surface tension.
4. Define, identify, and determine values for the pulmonary volumes (inspiratory reserve volume [IRV], tidal volume [TV], expiratory reserve volume [ERV], and residual volume [RV]) and the pulmonary capacities (inspiratory capacity [IC], functional residual capacity [FRC], vital capacity [VC], and total lung capacity [TLC]).
5. Recognize the mechanisms of gas exchange in the lungs and tissues including the respiratory membrane, Dalton’s Law and partial pressure, the influence of cellular respiration on oxygen and carbon dioxide gradients.
6. Recognize the ways oxygen and carbon dioxide are transported in blood including the characteristics of the oxygen-hemoglobin saturation curve and the role of bicarbonate.
7. Recognize the locations and functions of the brainstem respiratory centers and list the major chemical and neural stimuli to the respiratory centers.
8. Explain how the respiratory system relates to other body systems to maintain homeostasis in the event of hyperventilation, hypoventilation, panting, eupnea, hyperpnea, and apnea.
9. Given a disruption in the structure or function of the respiratory system (e.g., atelectasis), predict the possible factors or situations that might have created the disruption (i.e. given an effect, predict possible causes).

X. Recognize and describe select structures and functions of the digestive system.

1. Trace the pathway of ingested substances through the gastrointestinal (GI) tract and describe the major functions of the digestive system including mechanical digestion and chemical digestion.
2. Identify and describe the gross anatomic and microscopic structure and function of each of the gastrointestinal (GI) tract tunics (layers): mucosa, submucosa, muscularis (muscularis externa), and serosa or adventitia.
3. Identify and describe the location, structure, and function of the visceral and parietal peritoneum, serous fluid, and the peritoneal cavity.
4. Identify and describe the boundaries of the oral cavity including the structure and function of the salivary glands, teeth, and saliva in mastication.
5. Identify and describe the different regions of the pharynx with respect to the passage of air and/or food) including degluttion.
6. Identify and describe the gross and microscopic anatomy of the esophagus as well as its functions, including its location relative to other body structures.
7. Identify and describe the gross anatomy of the stomach, including its location relative to other body structures and anatomic specializations of the stomach tunics such as gastric glands and their cells (e.g., parietal cells, chief cells).
8. Identify and describe the gross anatomy of the small intestine, including its location relative to other body structures and anatomic specializations of the tunics such as: duodenal glands (Brunner glands), intestinal glands (crypts of Lieberkuhn), and Peyer patches (lymphoid [lymphatic] nodules).
9. Identify and describe the gross anatomy of the large intestine, rectum and anal canal, including their location relative to other body structures including specializations of the large intestine tunics.
10. Describe the location and general functions of the liver, gallbladder, and pancreas including the path of bile and pancreatic juice through the biliary appartus.
11. Compare and contrast the following: mastication, deglutition, peristalsis, mixing waves, segmentation, mass movement, and defecation and explain how volume, chemical composition, and osmolarity of chyme affect motility in the stomach and in the duodenum.
12. List the main digestive enzymes, their sources, their substrates, their products, and identify the locations of chemical digestion of macromolecules (e.g., carbohydrates, proteins, lipids).
13. List the organs and specific structures that facilitate the absorption of nutrients (e.g., monosaccharides, amino acids, fatty acids, monoglycerides) and explain the transport processes involved in the absorption of various nutrients including water.
14. List the components of a short reflex and a long reflex in the digestive system, describe the effects of the cephalic phase, gastric phase, and intestinal phase of digestion on various parts of the gastrointestinal (GI) tract, and describe the source, stimuli for release, targets, and actions of gastrointestinal (GI) tract hormones - (e.g., gastrin, cholecystokinin, secretin).
15. Explain how the digestive system relates to other body systems to maintain homeostasis.
16. Given a disruption in the structure or function of the digestive system (e.g., diarrhea), predict the possible factors or situations that might have created that disruption (i.e., given an effect, predict possible causes).

XV. Classify human nutrients and recognize and describe select components and functions of human metabolism.

1. Define nutrient, essential nutrient, and non-essential nutrient and recognize common uses in the body for carbohydrates, fats, proteins, vitamins, major minerals (e.g., calcium, sodium, potassium) and trace elements (e.g., iron, iodine, zinc).
2. Define metabolism, anabolism, and catabolism, and recognize the role of enzymes and cofactors in metabolic processes of anabolic and catabolic reactions.
3. Describe the processes of aerobic respiration in the oxidation of glucose to generate ATP and compare and contract the anabolic and catabolic processes of carbohydrate, fat, and protein metabolism during the absorptive and post-absorptive states.
4. Explain how metabolic processes participate in the maintenance of blood glucose and body temperature homeostasis including maintenance of basal metabolic rate, neural and chemical control of appetite, and energy yields per gram for carbohydrates, fats, and proteins..
5. Given a factor or situation (e.g., cirrhosis of the liver), predict the changes that could occur in metabolism and the consequences of those changes (i.e., given a cause, state a possible effect).
6. Given a disruption in metabolism (e.g., low hemoglobin concentration), predict the possible factors or situations that might have created that disruption (i.e., given an effect, predict possible causes).

XVI. Recognize and describe select structures and functions of the urinary system.

1. Describe the major functions of the urinary system and which organs are responsible for those functions.
2. Identify and describe the anatomic structure of the kidney, including its coverings; trace the path of blood flow through the kidney, from the renal artery to the renal vein; and trace the flow of filtrate from the renal corpuscle through the collecting duct.
3. Trace the path of urine from the collecting duct of the kidney to the external urethral orifice including the ureters, urinary bladder, and kidney.
4. Describe the three processes that take place in the nephron (i.e., filtration, reabsorption, and secretion) and explain how the integration of these three processes determines the volume and composition of urine.
5. For the important solutes of the body (e.g., Na+, K+, glucose, urea), describe how each segment of the nephron handles the solute and compare the filtration rate of the solute to its excretion rate relative to the transport processes involved in eliminating drugs (e.g., penicillin), wastes, and foreign substances, function of the juxtaglomerular apparatus, the renin-angiotensin system (RAS), release of aldosterone, vasopressin (ADH, antidiuretic hormone), and natriuretic peptide hormones.
6. Describe the role of the kidney in regulating erythropoiesis and its response to parathyroid hormone (PTH) on renal handling of calcium and phosphate including vitamin D activation.
7. Describe the micturition reflex and the role of the autonomic nervous system in the reflex as well as voluntary control of micturition.
8. Provide specific examples to demonstrate how urinary system processes help maintain solute and osmolarity homeostasis in the body.
9. Given a factor or situation (e.g., hyperglycemia), predict the changes that could occur in the urinary system and the consequences of those changes (i.e., given a cause, state a possible effect).

XVII. Recognize and describe the physiology of fluid, electrolyte, and acid-base balances.

1. Compare and contrast total body water (TBW) volumes in normal adult males and females including identification of the boundary walls that separate different body fluid compartments and the transport mechanisms by which water and other substances move between compartments.
2. Compare and contrast relative volumes and osmolarities of intracellular fluid (ICF) and extracellular fluid (ECF).
3. Describe the normal routes of body water entry and loss and compare and contrast the compensatory mechanisms used to restore blood volume, blood pressure, and body osmolarity during excess water intake, dehydration, or hemorrhage.
4. Describe the integrated responses of the endocrine and urinary systems to disruptions of potassium and calcium homeostasis.
5. State the normal ranges for arterial blood of pH, PCO2, and HCO3-, define acidosis and alkalosis, compare and contrast metabolic and respiratory causes of pH imbalances, explain how changes in pH outside the normal range adversely affect body functions, and describe the concept of compensation in relation to disruption of pH homeostasis.
6. Given arterial blood values for PCO2, pH and HCO3-, determine whether a patient is in acidosis or alkalosis and whether the cause of the pH disturbance is metabolic or respiratory.

XVIII. Recognize and describe select structures and functions of the reproductive system.

1. Compare and contrast the major anatomical structures of the male and female reproductive systems.
2. Identify and describe the gross anatomy, microscopic anatomy, and functions of the testes and other male reproductive structures and trace the pathway of sperm from the seminiferous tubules to the external urethral orifice of the penis
3. Identify and describe the gross anatomy, microscopic anatomy, and functions of the ovaries and other female reproductive structures and trace the pathway of the oocyte from the ovary to the uterus.
4. Describe the stages of spermatogenesis and spermiogenesis in the seminiferous tubule, including endocrine regulation and the roles of the sustentacular and interstitial cells.
5. Describe a typical ovarian cycle including folliculogenesis and ovulation and describe the functions of the hormones involved in the regulation of the reproductive processes including gonadotropin releasing hormone [GnRH], follicle stimulating hormone [FSH], luteinizing hormone [LH], androgens, inhibin, estrogens, progesterone).
6. Compare and contrast the timing and number of oocytes produced in oogenesis and spermatogenesis.
7. Name the phases of the uterine (menstrual) cycle and describe the anatomical changes in the uterine wall that occur during each phase.
8. Compare and contrast the events of female and male puberty, secondary sex characteristic development, and female and male physiological sexual responses including the structure and functions of the mammary glands, and compare and contrast menopause with andropause.
9. Describe the process of sperm capacitation and acrosomal reaction and the three phases of fertilization (i.e., corona radiata penetration, zona pellucida penetration, fusion of the oocyte and sperm plasma membranes).
10. Describe the hormones associated with pregnancy including the effects of these hormones and the functional changes in the woman’s body during pregnancy.
11. Define parturition (labor), describe the hormonal events that initiate and regulate labor, and describe the three stages of labor.
12. Define the postpartum period and describe the hormonal and functional changes in the woman’s body during the postpartum period including lactation.

XIX. Recognize and describe patterns and processes in human heredity.

1. Describe events that lead to genetic variability of gametes.
2. Define the terms chromosome, gene, allele, homologous, homozygous, heterozygous, genotype and phenotype.
3. Describe examples of prenatal and postnatal genetic testing.

XX. Recognize and describe select structures and functions of human embryology.

1. Define the pre-embryonic period, embryonic period, and fetal period, and describe the main events that occur in each.
2. Describe the changes that occur from zygote to morula to blastocyst including implantation and the formation of three primary germ layers resulting from gastrulation.
3. Define organogenesis and recognize formation of the neural plate, neural tube, and neural crest cells, extraembryonic membranes (i.e., amnion, yolk sac, allantois, chorion), and the maternal and fetal components of the placenta.
4. Describe the major events of the fetal period.

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, electrophoresis, dissection tools, and other instruments and techniques.
6. Work collaboratively to perform and interpret experiments.
7. Collect and tabulate data, perform basic data analyses, and prepare and interpret basic 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 Mastering Bundle*

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.)***

**Sample lecture outline:**

Week 1: Endocrine System

Week 2: Reproductive System

Week 3: Embryology with Introduction to Heredity

Week 4: Review Unit 1

Week 5: Exam 1and Blood

Week 6: The Heart

Week 7: Blood Vessels

Week 8: Lymphatic System and Immunity

Week 9: Review Unit 2

Week 10: Exam 2 and Respiratory System

Week 11: Digestive System

Week 12: Nutrients and Metabolism

Week 13: Urinary System

Week 14: Fluid/Electrolyte & Acid-Base Balance

Week 15: Review Unit 3 and Exam 3

Week 16: Comprehensive Exam

**Sample Course Calendar**

| **Exercise** | **Where to Find:** | **Points** | **Due Date** | **Learning Outcomess** |
| --- | --- | --- | --- | --- |
| Introduction to Mastering A&P | Mastering (13 min.) | 2 | Week 1 | Orientation |
| A&P 1 Review | Mastering (20 min.) | 5 | Week 1 | Review |
| Chapter 16 Reading Activity | Mastering (27 min.) | 3.9 | Week 1 | 1-9 |
| Chapter 27 Reading Activity | Mastering (36 min.) | 3.5 | Week 2 | 86-97 |
| Chapter 28 & 29 Reading Activity | Mastering (84 min.) | 4 | Week 3 | 98-104 |
| Chapter 16 Review Quiz | Mastering (6 min.) | 2 | Week 4 | 1-9 |
| Chapter 27 Review Quiz | Mastering (7 min.) | 2 | Week 4 | 86-97 |
| Chapter 28 & 29 Review Quiz | Mastering (5 min.) | 2 | Week 4 | 98-104 |
| Exam 1 | Mastering (30 min.) | 100 | Week 5 | 1-9, 86-104 |
| Chapter 17 Reading Activity | Mastering (46 min.) | 5.2 | Week 5 | 10-14 |
| Chapter 18 Reading Activity | Mastering (46 min.) | 3.5 | Week 6 | 15-19 |
| Chapter 19 Reading Activity | Mastering (28 min.) | 10.0 | Week 7 | 20-25 |
| Chapter 20 Reading Activity | Mastering (28 min.) | 10.0 | Week 8 | 26-29 |
| Chapter 21 Reading Activity | Mastering (44 min.) | 18.7 | Week 8 | 30-39 |
| Chapter 17 Review Quiz | Mastering (5 min) | 2 | Week 9 | 10-14 |
| Chapter 18 Review Quiz | Mastering (4 min.) | 2 | Week 9 | 15-19 |
| Chapter 19 Review Quiz | Mastering (5 min.) | 2 | Week 9 | 20-25 |
| Chapter 20 Review Quiz | Mastering (6 min.) | 2 | Week 9 | 26-29 |
| Chapter 21 Review Quiz | Mastering (5 min.) | 2 | Week 9 | 30-39 |
| Exam 2 | Mastering (30 min.) | 100 | Week 10 | 10-39 |
| Chapter 22 Reading Activity | Mastering (31 min.) | 4.8 | Week 10 | 40-48 |
| Chapter 23 Reading Activity | Mastering (23 min.) | 6.6 | Week 11 | 49-64 |
| Chapter 24 Reading Activity | Mastering (29 min.) | 6.6 | Week 12 | 65-70 |
| Chapter 25 Reading Activity | Mastering (34 min.) | 16.1 | Week 13 | 71-79 |
| Chapter 26 Reading Activity | Mastering (17 min.) | 4.9 | Week 14 | 80-86 |
| Chapter 22 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 40-48 |
| Chapter 23 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 49-64 |
| Chapter 24 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 65-70 |
| Chapter 25 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 71-79 |
| Chapter 26 Review Quiz | Mastering (6 min.) | 2 | Week 15 | 80-86 |
| Exam 3 | Mastering (30 min.) | 10 | Week 15 | 40-86 |
| Comprehensive Exam | Mastering (45 min) | 100 | Week 16 | 1-104 |

**Sample lab outline:**

Week 1, Lab Exercise 16: Endocrine System (Lab learning outcomes (LO 105, 106, 107, 108, 109, 110, 111, 112,)

Lab safety (LO 105), review of A&P 1 (LO 105 - 112), anatomy of the endocrine system (LO 106)

Week 2, Lab Exercise 16: Endocrine System (LO 106, 110, 111, 112)

PhysioEx computer simulations of thyroid hormone, diabetes mellitus, estrogen replacement therapy, and cortisol regulation (LO 106, 110, 111, 112)

Week 3, Lab Exercise 26: Reproductive System (LO 106, 109)

Anatomy of the reproductive system (LO 106) and reproductive physiology (LO 106, 109)

Week 4, Lab Exercise 27: Human Development (LO 106)

Overview of human development (LO 106) and pregnancy and childbirth (LO 106)

Week 5, Lab Exercise 19: Blood (LO 105, 106, 108, 109, 110, 111, 112, 113)

Formed elements and differential white blood cell count (LO 106, 109, 110), blood disorders, hematocrit determination (LO 108, 109, 110, 111, 112) and blood typing including a written Lab Report (LO 109, 110, 111, 112, 113)

Week 6, Lab Exercise 17: Cardiovascular System I: the Heart (LO 106, 109)

Heart anatomy dissection (LO 106, 109), pathway of blood flow (LO 106), cardiac muscle tissue (LO 106, 109), cardiac cycle and ECG (LO 106, 109), auscultation (LO 106, 109)

Week 7, Lab Exercise 18 Cardiovascular System II: Blood Vessels (LO 106, 109)

Structure of blood vessels (LO 106), identification of major arteries and veins (LO 106), pulse (LO 106, 109), and arterial blood pressure (LO 106, 109)

Week 8, Lab Exercises 17, 18, and 19 Cardiovascular PhysioEx Labs (LO 105, 106, 108, 109, 110, 111, 112)

PhysioEx computer simulation of blood tests including erythrocyte sedimentation rate, hemoglobin determination, and blood cholesterol (LO 105, 106, 108, 109), PhysioEx computer simulations of cardiac characteristics including refractory period, vagus nerve effects, temperature and heart rate, and effect of chemical modifiers and ions (LO 106, 109), and PhysioEx computer simulation of blood viscosity effects, blood vessel length, blood pressure on flow rate, radius on pump activity, and compensation (LO 106, 110, 111, 112).

Week 9, Lab Exercise 20: Lymphatic System and Immunity (LO 105, 106, 107, 108, 109, 110, 111, 112, 113)

Anatomy of the lymphatic system (LO 106) and bacterial staining with a written Lab Report (LO 105, 107, 108, 109, 110, 111, 112, 113)

Week 10, Lab Exercises in Lab Manual: Fetal pig dissection (LO 108, 109)

Week 11, Lab Exercise 21: Respiratory System (LO 106, 107, 108, 109, 110, 111, 112)

Anatomy of the respiratory system (LO 106), spirometry (LO 106, 107, 108, 109), and control of breathing (LO 108, 109, 110, 111, 112)

Week 12, Lab Exercise 22: Digestive System (LO 106, 107, 108, 109, 110, 111, 112)

Anatomy of the digestive system (LO 2) and digestive enzyme activity (LO 105, 106, 107, 108, 109, 110, 111, 112)

Week 13, Lab Exercise 23: Metabolism and Nutrition (LO 108, 109)

Spectrophotometric determination of protein in milk and other beverages (LO 105, 106, 107, 108, 109, 110, 111, 112)

Week 14, Lab Exercise 24 Urinary System: (LO 105, 106, 107, 108, 109, 110, 111, 112)

Anatomy of the urinary system (LO 106) and urinalysis (LO 105, 107, 108, 109, 110, 111, 112)

Week 15, Lab Exercise 25: Fluid, Electrolyte, and Acid-Base Balance (LO 105 – 113).

Determine the effect of pH buffers (LO 105, 106, 107, 108, 109, 110, 111, 112, 113) and PhysioEx computer simulation of acidosis and alkalosis (LO 106, 107, 108, 109, 110, 111, 112, 113)

**Sample Course Calendar**

| **Exercise** | **Where to Find:** | **Points** | **Due Date** | **Learning Outcomes** |
| --- | --- | --- | --- | --- |
| **Week 1** Exercise 16 Lab Activity: Introduction to the Endocrine System Anatomy | Lab Manual | 7 | 25-Aug | 105, 106, 107, 108, 110, 111, 112 |
| **Week 2** Exercise 16 Lab Activity (continued): Endocrine System Physiology | Lab Manual | 6 | 1-Sep | 106, 110, 111, 112 |
| **Week 3** Endocrine System Quiz | Canvas | 20 | 8-Sep | 105, 106, 107, 108, 109 |
| **Week 3** Exercise 26 Lab Activity: Reproductive System | Lab Manual | 7 | 8-Sep | 106, 109 |
| **Week 4** Reproductive System Quiz | Canvas | 20 | 15-Sep | 106 |
| **Week 4** Exercise 27 Lab Activity: Development | Lab Manual | 7 | 15-Sep | 106 |
| **Week 5** Development and Pregnancy Quiz | Canvas | 20 | 22-Sep | 106 |
| **Week 5** Exercise 19 Lab Activity: Blood Testing | Handout | 7 | 22-Sep | 105 - 113 |
| **Week 6** Blood Testing Quiz | Canvas | 20 | 29-Sep | 105 - 109 |
| **Week 6** Exercise 17 Lab Activity: Heart Anatomy and Physiology | Lab Manual | 6 | 29-Sep | 106, 109 |
| **Week 7** Heart Quiz | Canvas | 20 | 6-Oct | 106, 109 |
| **Week 7** Lab Report on Blood Testing (First Draft) | Handout | 10 | 6-Oct | 113 |
| **Week 7** Exercise 18 Lab Activity: Blood Vessels | Lab Manual | 6 | 6-Oct | 106, 109 |
| **Week 8** Blood Vessels Quiz | Canvas | 20 | 13-Oct | 106, 108, 109 |
| **Week 8** Lab Report on Blood Testing (Second Draft) | Handout | 10 | 6-Oct | 113 |
| **Week 8** Exercises 17, 18, & 19 Lab Activity: PhysioEx Computer Simulations on Blood, the Heart, and Blood Vessels | Lab Manual | 7 | 13-Oct | 105 - 112 |
| **Week 9** Final Lab Report Blood Testing | Handout | 30 | 20-Oct | 113 |
| **Week 9** Exercise 20 Lab Activity: Lymphatic System and Bacteria | Lab Manual | 7 | 20-Oct | 106 |
| **Week 10** Lab Report on Bacterial Testing (First Draft) | Handout | 10 | 27-Oct | 113 |
| **Week 10** Fetal Pig Dissection Lab Activity | Lab Manual | 7 | 27-Oct | 106, 109 |
| **Week 11** Fetal Pig Dissection Quiz | Canvas | 20 | 3-Nov | 106, 109 |
| **Week 11** Lab Report on Bacterial Testing (Second Draft) | Handout | 10 | 3-Nov | 113 |
| **Week 11** Exercise 21 Lab Activity: Respiratory System | Lab Manual | 7 | 3-Nov | 106 – 112 |
| **Week 12** Final Lab Report Bacterial Testing | Handout | 30 | 10-Nov | 113 |
| **Week 12** Exercise 22 Lab Activity: Digestive System | Lab Manual | 7 | 10-Nov | 106 – 112 |
| **Week 13** Respiratory System Quiz | Canvas | 20 | 17-Nov | 106, 109 |
| **Week 13** Metabolism and Nutrition Lab Activity | Handout | 7 | 17-Nov | 105, 106, 107, 108, 110, 111, 112 |
| **Week 14** Digestive System Quiz | Canvas | 20 | 24-Nov | 106, 109 |
| **Week 14** Exercise 24 Lab Activity: Urinary System | Lab Manual | 6 | 24-Nov | 106 – 112 |
| **Week 15** Urinary System Quiz | Canvas | 20 | 1-Dec | 105, 106, 109 |
| **Week 15** Exercise 25 Lab Activity: Fluid, Electrolyte, and Acid-Base Balance | Lab Manual | 6 | 1-Dec | 106 – 112 |

**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](mailto: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.