

JEFFERSON COLLEGE

COURSE SYLLABUS

BIO212

ANATOMY AND PHYSIOLOGY II

4 Credit Hours

Prepared by:
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Ms. Shirley Davenport, Dean, Arts & Science Education

BIO212 Anatomy and Physiology II

I. CATALOG DESCRIPTION

- A. Course prerequisites:
- BIO211 with a grade of “C” or better or special permission of the Dean
 - Reading proficiency
 - BIO120 will not fulfill the prerequisite for BIO212
- B. 4 semester credit hours
- C. Anatomy and Physiology II is a continuation of BIO211 with emphasis on cardiovascular, lymphatic, respiratory, digestive, excretory, and reproductive systems. Laboratory time is required. (F, S, Su)
- D. Curricular alignment:
- Fulfills part of Natural Sciences (Biological Sciences) with lab for select AAS degrees general education requirement, NOT part of MOTR CORE 42
 - Elective course applies toward AA or AAT degree.
 - Fulfills AAS – Health Information Technology degree requirement.
 - Fulfills AAS – Bi-Level Nursing degree requirement.
 - Fulfills Practical Nursing certificate – Bi-Level Nursing requirement.
 - Fulfills AAS – Occupational Therapy Assistant degree requirement.
 - Fulfills AAS – Physical Therapist Assistant degree requirement.
 - Fulfills AAS – Radiologic Technology degree requirement.
 - Fulfills AAS – Veterinary Technology degree requirement.

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Expected Learning Outcomes	Assessment Measures
Identify the components of the cardiovascular system and the functions for each; dissect and inspect the structures of a sheep heart and know and relate these structures to a human heart; diagram and memorize major arteries and veins; examine red and white blood cells and platelet cell characteristics; calculate red blood cell counts and hematocrit; differentiate white blood cell types; perform blood typing on simulated blood samples; explain the process of hemostasis and capillary pressure; diagram the flow of blood through the cardiovascular system; employ ECG iWorx computer programs to record, label, measure, and examine various electrical events of an electrocardiogram;	Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion

<p>interpret abnormal ECGs; measure heart rates and blood pressure and investigate effects on body position and activity; identify cardiovascular structures on a dissected cat</p>	
<p>Identify the components of the lymphatic and immune system and the functions for each; distinguish between lymphatic tissues and organs; describe the characteristics of lymphocytes; know the functions of innate and adaptive defenses; break down the immune response; label the parts of an antibody; list the various antibody and describe their functions; classify and define types of allergic reactions; recognize various disorders and diseases of the immune system. investigate ELISA through manipulating computer simulations</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>
<p>Identify the structures and functions of the respiratory system; distinguish between the various respiratory strategies; review the muscle mechanics involved in respiration; differentiate pulmonary ventilation, external and internal respiration, and cellular respiration; distinguish between the various types of breathing; manipulate respiratory volumes and rates and record data through the iWorx program; be label and measure a spirogram and relate it to lung capacities; discuss and diagram the transport of gases in the blood; investigate partial pressures and gradients in gas exchange; understand the homeostatic mechanisms relating to respiratory control; contrast fetal and adult hemoglobin and respiratory structures; identify respiratory organs and structures on a dissected cat</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>
<p>List the functions of the digestive system; identify major events of digestion and the basic physiology of each digestive organ including secretions beginning with the mouth and swallowing; identify histological differences of the digestive system; list and describe components and functions of gastric regulation; discuss homeostatic mechanisms regulating digestion; discuss the roles of accessory organs involved in digestion; explain various ways nutrients and water are absorbed by the body; identify digestive organs and structures on a dissected cat</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>

<p>Compare and contrast mechanisms in organic macromolecule metabolism; explain how metabolic activities are coordinated in the body and relate these to cellular respiration; describe various types of energy reserves of the body; discuss utilization of homeostatic mechanisms involving metabolism; outline a balanced diet and its importance; discuss the functions of vitamins, minerals, and other metabolites; describe homeostatic mechanisms maintaining constant body temperature</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>
<p>Identify the structures and functions of the excretory system; recognize the components of the nephron; describe the processes involved during urine formation and contrast changes that occur; identify components of urine; explain the process of micturition and describe associated control mechanisms; describe how the urinary system interacts with other systems to maintain body fluids and regulates blood pressure; dissect and identify urinary structures on a sheep kidney; analyze simulated urine specimens</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>
<p>Describe how water and electrolytes are distributed in the body; explain homeostatic processes of fluid and electrolyte composition in the body; discuss how the body compensates for fluid and /or electrolytic shifts; explain homeostatic means stabilizing pH, and intra and extracellular fluids; identify threats to acid-base balance, and discuss pH regulation in the body</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>
<p>Identify the structures and functions of the reproductive system; explain spermatogenesis and oogenesis; list the components of the male and female reproductive system and describe the function of each; discuss the events that occur during the ovarian and menstrual cycle; describe hormonal mechanisms regulating male and female reproductive activities; discuss the production, storage, and transport of sex cells; describe the anatomical, physiological, and hormonal changes that accompany pregnancy; discuss the changes in reproductive systems in male and females occurring at puberty and with aging; discuss how the reproductive system interacts with other systems in the body; identify reproductive structures on a dissected cat</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>

<p>Contrast somatic and gametic cells; describe gametic functions; describe gametic formation, discuss meiotic abnormalities resulting in genetic defects including causes and characteristics of various syndromes; relate basic principles of genetics to the inheritance of human traits; describe the process of fertilization; know the stages of embryonic and fetal development; explain major effects of pregnancy on a mother's body; describe the process of labor and delivery; explain the regulation of developmental processes; list and describe the stages of life after delivery</p>	<p>Examination, quizzes, laboratory activities, homework, assignments, and classroom lecture and discussion</p>
<p>Demonstrate the ability to formulate hypotheses and carry out various experiments to test the hypotheses</p>	<p>Laboratory activities</p>
<p>Demonstrate the ability to properly handle and carry out dissections on sheep organs, fetal pigs, and cats; carry out the proper disposal of biological organisms and clean-up of their respective work areas using disinfectants and aseptic techniques; investigate, analyze, and calculate data from various hands-on activities; employ iWorx programs and collect and evaluate results; view videos, manipulate computer simulations and animations and relate and describe the results to physiological processes in the body</p>	<p>Laboratory activities</p>

III. OUTLINE OF TOPICS

A. Circulatory system

1. Components
2. Functions of blood
3. Composition of blood
4. Red blood cell characteristics
5. Red blood cell destruction and recycling
6. Red blood cell counts
7. Hematocrit
8. Hemoglobin values
9. Hematopoiesis-location and regulation
10. Erythropoiesis
11. Blood typing including rhesus factor
12. White blood cell counts
13. Types of white blood cells
14. Platelets
15. Hemostasis
16. Structure of the heart

17. Comparison of cardiac and skeletal action potentials
18. Blood flow through the heart
19. Pulmonary and systemic circuits
20. Cardiac physiology
21. Heart rates
22. Cardiac cycle
23. Heart sounds
24. Cardiodynamics
25. Electrocardiogram
26. Blood vessels
27. Circulatory physiology – blood pressure
28. Circulatory physiology – capillary pressure

B. Lymphatic/immune system

1. Functions of the lymphatic/immune system
2. Lymphatic vessels
3. Lymphatic tissues and organs
4. Lymphocyte characteristics
5. Functions of innate (nonspecific) defenses
6. Functions of adaptive (specific) defenses
7. Types of immunity
8. Lymphocyte activation
9. Immune response
10. Structure of antibodies
11. Functions of antibodies
12. Types of allergic reactions
13. Disorders and diseases of the immune system

C. Respiratory

1. Functions of the respiratory system
2. Structures
3. Pulmonary ventilation
4. Respiratory rates and volumes
5. Pressure gradients associated with ventilation
6. Types of breathing
7. Gas transport in the blood
8. Control of respiration

D. Digestive system

1. Functions of digestive system
2. Histology of digestive system
3. Digestive organs and their secretions
4. Control mechanisms
5. Stages of gastric regulation
6. Accessory organs of digestion
7. Processing and absorption of nutrients and water

E. Metabolism

1. Mechanisms in the metabolism of organic macromolecules
2. Coordination of metabolic activity
3. Cellular respiration

4. Energy reserves
 5. Absorptive and post absorptive states
 6. Balanced diet
 7. Function of vitamins and minerals
 8. Homeostasis and thermoregulation
- F. Urinary system
1. Functions
 2. Structures
 3. Composition of the nephron
 4. Urine formation
 5. Urine volume regulation
 6. Organs involved in the micturition reflex
 7. Micturition
 8. Homeostatic effects related to other body systems
- G. Fluids and electrolytes
1. Distribution of water and electrolytes
 2. Regulation of fluids and electrolytes
 3. Fluid shifts
 4. Electrolyte balance
 5. pH control
 6. Threats to pH homeostasis
- H. Reproductive system
1. Functions
 2. Organs and structures
 3. Spermatogenesis and oogenesis
 4. Male reproductive system structures, glands, and functions
 5. Female reproductive system structures, glands, and functions
 6. Hormonal regulation of spermatogenesis and oogenesis
 7. Nervous system control of the male and female sexual functions
 8. Menopause and male climacteric
- I. Development and inheritance
1. Formation of sperm and egg
 2. Fertilization
 3. Stages of embryonic and fetal development
 4. Developmental regulation
 5. Nervous system control of the male and female sexual function
 6. Gestational phases
 7. Maternal systems
 8. Structure and functional changes of the uterus
 9. Stages of labor and parturition
 10. Postnatal stagesRegulation of lactation
 11. Genetics
 12. Patterns associated with inheritance
 13. Mutations
 14. Genetic analysis
 15. Chromosomal abnormalities

IV. METHODS OF INSTRUCTION

- A. Lecture
- B. PowerPoint presentations
- C. Mastering A&P website assignments
- D. Classroom discussions
- E. Laboratory exercises
- F. Textbook readings
- G. Classroom and laboratory drill exercises
- H. Tutorial computer laboratory
- I. Videos
- J. Animations
- K. Group work
- L. Case studies

V. REQUIRED TEXTBOOKS

- A. Martini, F. *Fundamentals of Anatomy and Physiology* (current edition). Prentice Hall, Upper Saddle River, NJ.
- B. *Mastering A&P* access
- C. *Integrate* Laboratory Manual for Jefferson College

VI. REQUIRED MATERIALS

Pencil (#2), paper

VII. SUPPLEMENTAL REFERENCES

- A. Applications Manual, and Atlas Physiology CD (packaged with textbook)
- B. Online supplemental textbook (access with text)
- C. Anatomy and Physiology coloring book
- D. Course website on Blackboard

VIII. METHODS OF EVALUATION

- A. Distribution of final grade
Students are evaluated by three hourly exams, a comprehensive final exam, laboratory exercises, quizzes, and PhysioEX exercises or case studies
- B. Grading scale:
90-100% = A
80-89% = B
70-79% = C
60-69% = D
Below 60% = F
- C. Attendance policy
Student attendance is mandatory. There are no excused absences. If a student misses more than 15% of the total class meeting time in a semester (including lecture and laboratory), the student may be prohibited from attending class by the instructor. In such cases, the student must officially withdraw from the course by the designated withdrawal date in order to reduce the possibility of receiving a grade of "F" for the course.

No make-up exams are given, however students are allowed to replace their lowest grade with their final exam grade (percentage) if their final exam grade is greater. Students arriving more than 10 minutes late will not be allowed to take the test, and that test will result in a grade of zero. The final exam is mandatory, is worth 150 points, and cannot be made up.

Students are required to arrive on time for pre-laboratory instruction. Students who arrive late to lab, or leave lab before its successful completion will receive half of that day's assignment points. Laboratory exercises cannot be made up.

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.