

**JEFFERSON COLLEGE**  
**COURSE SYLLABUS**

**BIO208**  
**VERTEBRATE PHYSIOLOGY**  
4 Credit Hours

Prepared by:  
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Revised:  
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Minor Revision or Update by: Fran Moore  
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Ms. Linda Abernathy, Division Chair, Math, Science & Business  
Ms. Shirley Davenport, Dean, Arts & Science Education

## BIO208 Vertebrate Physiology

### I. CATALOG DESCRIPTION

- A. Course pre-requisites:
- BIO207 (Vertebrate Anatomy) with a grade of “C” or better
  - Reading proficiency
- B. 4 semester credit hours
- C. Vertebrate Physiology is the study of function associated with vertebrate organs, organ systems, and integration of these systems for maintaining life. Laboratory time is required (S)
- D. Curricular alignment:
- Fulfills part of Natural Sciences (Biological Sciences) with lab for select AAS degree general education requirement, NOT part of MOTR CORE 42.
  - Elective course applies toward AA or AAT degree.
  - Fulfills AAS – Veterinary Technology degree requirement.

### II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Expected Learning Outcomes	Assessment Measures
Identify cellular organelles and describe the function of each; diagram the structure of the cell membrane; differentiate between active and passive transport processes and osmosis and diffusion; predict the resulting changes to be exhibited in vertebrate cells placed in different tonic solutions; compare various types of cancers and chemotherapeutic drugs	Classroom lecture and discussion, homework assignments, examination, and laboratory activities
Explain the process of bone formation, ossification and growth, hormonal control of calcium concentrations, and fracture repair; define bone terminology; identify bone characteristics, bone cells, and bone shapes and structures; differentiate between red and yellow bone marrow	Classroom lecture and discussion, homework assignments, and examination
Identify the different types of muscle, functions of muscles and characteristics of muscles; describe the innervation of skeletal muscle and the process of muscle contraction; differentiate skeletal muscle fibers; demonstrate the effect of exercise on muscles; compare incision sites in muscle tissue with healing time	Classroom lecture and discussion, homework assignments, examination, and laboratory activities

<p>Identify the components of the cardiovascular system and the functions for each; examine red blood cell and white blood cell characteristics; calculate red blood cell counts and hematocrit; differentiate white blood cell types; explain the process of hemostasis and capillary pressure; diagram the flow of blood through the cardiovascular system; investigate the effects of body position on heart rate and blood pressure; distinguish between the various electrical events of an electrocardiogram</p>	<p>Classroom lecture and discussion, homework assignments, examination, and laboratory activities</p>
<p>Identify the structures and functions of the respiratory system; distinguish between the various respiratory strategies; differentiate pulmonary ventilation, external and internal respiration, and cellular respiration; distinguish between the various types of breathing and respiratory volumes and rates; discuss and diagram the transport of gases in the blood</p>	<p>Classroom lecture and discussion, homework assignments, and examination</p>
<p>Identify the functions and divisions of the nervous system; list the components of a neuron; demonstrate the events of a nerve impulse; illustrate synaptic transmission; describe the components of the reflex arc; differentiate between autonomic and somatic reflexes; investigate the various senses</p>	<p>Classroom lecture and discussion, examination, and laboratory activities</p>
<p>Classify hormones; distinguish between the various mechanisms of hormone action; memorize the endocrine glands and the function(s) of the hormone(s) produced by each; differentiate hormones and pheromones; compare and contrast the endocrine system and the nervous system</p>	<p>Classroom lecture and discussion, and examination</p>
<p>Identify the structures and functions of the excretory system; recognize the components of the nephron; describe the processes involved during the formation of urine; explain the process of micturition</p>	<p>Classroom lecture and discussion, and examination</p>
<p>List the functions of the digestive system; identify major events of digestion and the basic physiology of each digestive organ</p>	<p>Classroom lecture and discussion, and examination</p>
<p>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 estrous cycle</p>	<p>Classroom lecture and discussion, and examination</p>

Demonstrate the ability to present and synthesize material related to various pathophysiology topics	Student pathophysiology presentations and exam questions
Demonstrate the ability to formulate hypotheses and carry out various experiments to test the hypotheses	Laboratory activities
Demonstrate the ability to properly handle and carry out experiments using mice and dogs	Laboratory activities

### III. OUTLINE OF TOPICS

- A. Cytology
1. Cell theory
  2. Organelles
  3. Cell membrane physiology
  4. DNA case study
  5. Clinical application - cancer
  6. Clinical application – chemotherapeutic drugs
- B. Skeletal system
1. Bone terminology
  2. Bone characteristics
  3. Functions of bones
  4. Skeletal system composition
  5. Bone structure
  6. Bone cells
  7. Blood supply to bone
  8. Formation of bone
  9. Bone growth
  10. Bone shapes
  11. Bone marrow
  12. Hormonal control of calcium concentrations
  13. Fracture repair
  14. Pathophysiology
- C. Muscular system
1. Types of muscle tissue
  2. Functions of muscle tissue
  3. Characteristics of muscle tissue
  4. Innervation of skeletal muscle
  5. Neuromuscular junction disruptions
  6. Skeletal muscle fiber components
  7. Muscle contraction physiology
  8. Skeletal muscle twitch
  9. Types of skeletal muscle fibers
  10. Muscles and exercise
  11. Clinical application – abdominal incisions

- D. Cardiovascular system
1. Components
  2. Functions of blood
  3. Composition of blood
  4. Red blood cell characteristics
  5. Red blood cell counts
  6. Hematocrit
  7. Hemoglobin values
  8. Erythropoiesis
  9. Red blood cell destruction
  10. White blood cell counts
  11. Types of white blood cells
  12. Platelets
  13. Hemostasis
  14. Structure of the heart
  15. Blood flow through the heart
  16. Cardiac physiology
  17. Heart rates
  18. Cardiac cycle
  19. Heart sounds
  20. Cardiodynamics
  21. Electrocardiogram
  22. Blood vessels
  23. Circulatory physiology – blood pressure
  24. Circulatory physiology – capillary pressure
  25. Pathophysiology
- E. Respiratory system
1. Functions
  2. Respiratory strategies
  3. Structures
  4. Pulmonary ventilation
  5. Respiratory rates and volumes
  6. Types of breathing
  7. External respiration
  8. Internal respiration
  9. Gas transport in the blood
  10. Cellular respiration
  11. Control of respiration
- F. Nervous system
1. Functions
  2. Divisions
  3. Neurons
  4. Neurophysiology
  5. Synaptic transmission
  6. Types of synapses

7. Reflexes
8. Senses
9. Pathophysiology

G. Endocrine system

1. Hormone classification
2. Mechanism of hormone action
3. Endocrine glands and hormone function
4. Pheromones
5. Pathophysiology

H. Excretory system

1. Functions
2. Structures
3. Composition of the nephron
4. Urine formation
5. Urine volume regulation
6. Micturition

I. Digestive system

1. Functions
2. Digestive activities
3. Ingestion
4. Food storage
5. Digestion and absorption
6. Egestion

J. Reproductive system

1. Spermatogenesis and oogenesis
2. Male reproductive system structures and functions
3. Female reproductive system structures and functions
4. Estrous cycle

IV. METHODS OF INSTRUCTION

- A. Lecture
- B. PowerPoint presentations
- C. Textbook readings and assignments
- D. Class discussion
- E. Laboratory exercises
- F. Pathophysiology presentations

V. REQUIRED TEXTBOOKS

Colville, T. P., & Bassert, J. M. *Clinical Anatomy and Physiology for Veterinary Technicians* (current edition). St. Louis, MO: Mosby Elsevier.

VI. REQUIRED MATERIALS

No materials required

VII. SUPPLEMENTAL REFERENCES

No supplemental references required

VIII. METHODS OF EVALUATION

A. Distribution of final grade

Students are evaluated by eight hourly exams, a comprehensive final exam, laboratory exercises, and a pathophysiology presentation

B. Grading scale

93-100% = A

84-92% = B

75-83% = C

60-74% = 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 time within a semester (including lecture and laboratory), the instructor may prohibit the student from attending the class. 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 will be given, however students are allowed to drop their lowest grade on one of the hourly tests. For any student absent on testing day, the missed test will automatically be dropped, as this test would be their lowest grade of all tests taken. Students arriving more than 10 minutes late for any given test will not be allowed to take the test, and as a result that test grade will be dropped. Any additional missed tests or late arrivals will result in a grade of zero, and the test grade will not be dropped. The final exam is mandatory and cannot be made up.

Students arriving late to lab will not be allowed to participate in the laboratory activity and will receive a grade of zero. Students who leave lab before the successful completion of the lab will also receive a grade of zero. 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.