

**JEFFERSON COLLEGE**

**COURSE SYLLABUS**

**BIO207**

**VERTEBRATE ANATOMY**

**4 Credit Hours**

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**Revised Date: November 2005  
by  
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## BIO207 VERTEBRATE ANATOMY

### I. CATALOGUE DESCRIPTION

Prerequisite: High school biology with grade of C or better and chemistry, or BIO101  
4 semester hours credit

Vertebrate Anatomy compares members of the vertebrate classes in taxonomy, anatomy, and evolutionary relationships. All major organ systems are examined as are many special modifications for specific life styles. Vertebrate Anatomy is a laboratory course and will meet the laboratory science requirement for the Associate of Arts degree. (F)

### II. GENERAL COURSE OBJECTIVES

The student must:

- A. Know the names, major characteristics, and common examples of vertebrates.
- B. Know the major stages of early development of an embryo and what germ layer various organs developed from.
- C. Know the major types of animal tissues
- D. Be able to describe, identify or label organ tissues or organ areas of the following organ systems in representative animals of each vertebrate class
  1. integumentary system
  2. skeletal system
  3. muscular system
  4. digestive system
  5. respiratory system
  6. excretory system
  7. reproductive system
  8. circulatory system
  9. nervous system
  10. endocrine system
- E. Understand those unique organ systems found in various vertebrate classes and relate their special modifications to the species life style
- F. Be able to identify the increased complexity of most organ systems when comparing the more advanced (recent) vertebrate classes to the more primitive (older) ones.

### III. COURSE OUTLINE

- A. Classification of Vertebrates
- B. Development

- C. Biological Molecules
- D. Cells
- E. Tissues
- F. Integumentary System
- G. Skeletal System
- H. Muscular System
- I. Nervous System
- J. Endocrine
- K. Digestive System
- L. Respiratory System
- M. Cardiovascular System
- N. Urinary System
- O. Reproductive System
- P. Immune System

#### IV. UNIT OBJECTIVES

- A. Classification of Vertebrates
  1. Know the phylogeny of vertebrates
  2. Know the characteristics of the classes and orders of vertebrates
- B. Development
  1. Know the major states in early embryonic development of vertebrates.
  2. Know the processes causing each stage of development.
  3. Know the embryonic tissues to adult tissues and organs.
- C. Biological Molecules
  1. Know the 4 kinds of biological molecules.
  2. Know the structure and activity of enzymes.
- D. Cells

1. Know anatomy of eukaryotic cells.
2. Know organelles of eukaryotic cells.
3. Know gene expression of eukaryotic cells.

E. Tissues

1. Know the four types of animal tissues.
2. Know the classification of each kind of animal tissue.
3. Know the cell and matrix structure of each animal tissue.
4. Know the types of biological molecules characteristic of each tissue.

F. Integument

1. Know the layers of integument.
2. Know the layers and cells of the epidermis.
3. Know the layers and cells of dermis.
4. Know the anatomy of the hair follicle.
5. Know the anatomy of epidermal glands.
6. Know the structure of claws, hoof, and horns.

G. Skeletal System

1. Know the functions and types of skeletal systems.
2. Know the development of skeletal system.
3. Know the cellular and matrix structure of bone.
4. Know the anatomy of the skeletal system.
5. Know the endocrine regulation of bone metabolism.
6. Know the unique characteristics of ungulate limb anatomy.

H. Muscular System

1. Know functions of the muscular system.
2. Know types of muscle tissue.
3. Know cellular anatomy of muscle tissue.
4. Know gross anatomy of horse --characteristic vertebrate.

I. Nervous System

1. Know an outline of the anatomy of a vertebrate nervous system.
2. Know the cellular anatomy.
3. Know the structure of nerve and neural pathways.
4. Know the structure of spinal cord.
5. Know the structure of the peripheral nervous system.
6. Know the structure of the autonomic nervous system.

J. Endocrine System

1. Know characteristics of endocrine organs.
2. Know structure of types of hormones.
3. Know overview of endocrine organs: thyroid; stomach; testes; ovary; kidney.
4. Know anatomy of hypothalamic-pituitary system.

5. Know structure, regulation, and activities of adrenal cortex.
6. Know structure, regulation, and activities of adrenal medulla.
7. Know structure, regulation, and activities of pancreas.

K. Digestive System

1. Know gross anatomy of digestive system.
  - a. buccal cavity
  - b. pharynx
  - c. esophagus
  - d. stomach
  - e. small intestine
  - f. large intestine
2. Know exocrine glands of digestive system
  - a. pancreas
  - b. liver
3. Know structure and function of the rumen.
4. Know structure and function of the cecum of the horse.

L. Respiratory System

1. Know meanings of respiration.
2. Know histology of respiratory system.
3. Know gross anatomy of respiratory system:
  - a. nasal cavity
  - b. pharynx
  - c. trachea
  - d. bronchi
  - e. bronchioli
  - f. alveoli
4. Know cellular anatomy of respiratory surface.

M. Cardiovascular System

1. Know outline of the components of cardiovascular system.
2. Heart:
  - a. know anatomy of heart and surrounding cavities
  - b. know thoracic cavity: pleural and mediastenum
  - c. know tissues of heart
  - d. know cavities of valves of heart
3. Circulatory systems:
  - a. know cell anatomy of blood vessels
  - b. know major pathways of cranial and caudal arteries and veins
4. Blood
  - a. know blood and other body fluids
  - b. know chemical characteristics of blood
  - c. know cellular components of blood

N. Urinary System

1. Know the function of the urinary system.
2. Know gross anatomy of the urinary system.
3. Know cellular morphology of nephron, renal corpuscle, and filtration membrane.

O. Reproductive System

1. Know the anatomy of the male reproductive system.
2. Know the anatomy of the female reproductive system.
3. Know modern reproductive technologies: twinning and cloning.

V. METHOD(S) OF INSTRUCTION

- A. Lectures using power point slides, lecture notes via internet and web pages.
- B. Laboratory dissection of cat. microscope slides of tissues and organs.

VI. REQUIRED TEXTBOOK(S) WITH PUBLICATION INFORMATION

Collville, Thomas, and Joanna M. Bassert. 2002. Clinical Anatomy and Physiology for Veterinary Technician.

Sabastian, Aurora M.. and Dale W Fishbecht. 2005. Mammalia Anatomy: The Cat. 2<sup>nd</sup> Edition. Englewood, Colorado: Morton Publishing Co.

VII. REQUIRED MATERIALS (STUDENT)

- A. Printed copy of power point slides

VIII. SUPPLEMENTAL REFERENCES

None.

IX. METHOD OF EVALUATION (STUDENT)

- A. Lecture Exams: Objective questions in form of matching, multiple choice, short answer, and labeling diagrams.
- B. Laboratory Practical: Exams identifying structures of the dissected cat.