BIO-1410: ANATOMY & PHYSIOLOGY OF DOMESTIC ANIMALS I

Cuyahoga Community College

Viewing: BIO-1410 : Anatomy & Physiology of Domestic Animals I
Board of Trustees:
January 2021

Academic Term:
Fall 2021

Subject Code
BIO - Biology

Course Number:
1410

Title:
Anatomy & Physiology of Domestic Animals I

Catalog Description:
Explores the comparative anatomy and physiology of the canine, feline, equine, bovine, ovine, porcine and avian species. Focuses on cellular biology, tissues and membranes, and the integumentary, skeletal, muscular, nervous, endocrine, and circulatory systems with emphasis on species variations. Laboratory includes preserved and fresh specimens, models, microscopic observations, and audio/visual aids.

Credit Hour(s):
4

Lecture Hour(s):
3

Lab Hour(s):
2

Other Hour(s):
0

Requisites

Prerequisite and Corequisite
BIO-1100 Introduction to Biological Chemistry or concurrent enrollment; or CHEM-1010 Introduction to Inorganic Chemistry, or concurrent enrollment; or departmental approval: comparable knowledge or skills.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour. Courses offered in other part of terms (e.g. 14 week, 8 week, flexibly scheduled, etc.) ensure equivalent workloads. Students should prioritize their time accordingly, particularly when taking part of term courses.
II. ACCESSIBILITY STATEMENT

Tri-C is committed to providing online services, software, and electronic information that is accessible and usable by all of our students, including those with disabilities. It is our mission to provide accessible opportunities and services by complying with Federal and State accessibility guidelines.

If you need any special course adaptations or accommodations because of a documented disability, please contact Student Accessibility Services (SAS) (https://www.tri-c.edu/student-accessibility-services/) or SAS via email at CCCSAS@TRI-C.EDU. Students have the right to request accommodations at any point in the semester; however, accommodations are not retroactive.

Eastern (216) 987-2052 – Voice. (216) 987-2423 – Fax
Metropolitan (216) 987-4344 – Voice.
(216) 987-3257 – Fax.
Western (216) 987-5079 – Voice. (216) 987-5118 – Fax.
Westshore (216) 987-3900 – Voice. (216) 987-5294 - Fax.
Brunswick (216) 987-5079 – Voice. (216) 987-5118 - Fax.
Off-Site (216) 987-5079 – Voice

III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status.

Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts.

Therefore, attendance is recorded in the following ways:

- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available at http://www.tri-c.edu/student-resources/documents/studenthandbook.pdf You must also
VI. CORONAVIRUS/COVID-19 STATEMENT

Students are responsible for adhering to all College health and safety guidance, including that which relates to the COVID-19 pandemic.
Public health requirements and standards are changing rapidly, and the College is adapting its guidance accordingly. Please check your Tri-C email and visit tri-c.edu/coronavirus regularly for updates.
All students must adhere to the following general guidelines, until further notice:
• Remain at home if you are ill or experiencing symptoms of illness. Do not attend any in-person class or gathering.
• Notify your instructor(s) if you are ill, have tested positive for COVID-19, or were exposed to an individual who has tested positive for COVID-19 and they will report the information to the Tri-C Compliance & Risk Management team and you may be contacted for follow-up information.
• Wear a mask or face covering at all times, including, but not limited to: upon entering and exiting any Tri-C facility, in class, and in all common areas.
• Maintain a distance of at least six feet between yourself and others at all times and if you must pass near an individual do it quickly and do not linger.
• Provide the College with relevant information about your current health status and participate in any required on-site checks (e.g., temperature checks, current contact information, symptom profile, etc.).
• Use only designated areas of Tri-C facilities, including entrances and exits. Sign in and out of Tri-C facilities as directed.
The general guidelines listed above do not encompass all coronavirus-related guidance. These guidelines are subject to change at the discretion of the College and under the direction of public health authorities. Students who fail to adhere to this guidance may be subject to disciplinary action under the College’s Student Code of Conduct and the Student Judicial Code.

Outcomes

Course Outcome(s):
Apply the fundamental knowledge of the skeletal and muscular system of the canine, feline, equine, bovine, ovine, porcine and avian species when working in biomedical research, veterinary medicine, animal agriculture or other advanced scientific study.

Objective(s):
1. Describe the microscopic and gross anatomical features of bone, cartilage and ligaments, including the healing mechanism.
2. Identify the major anatomical structures of the axial and appendicular skeleton and locate clinically important landmarks.
3. Recognize the microscopic features of the various types of muscle tissues.
4. Describe the physiology of muscle contraction.
5. Identify the major muscle groups of the head, neck, trunk and limbs and note important clinical landmarks.

Course Outcome(s):
Apply the fundamental knowledge of the nervous system of the canine, feline, equine, bovine, ovine, porcine and avian species when working in biomedical research, veterinary medicine, animal agriculture or other advanced scientific study.

Objective(s):
1. Describe the structure and function of the spinal cord, including sensory and motor pathways.
2. Differentiate between the sympathetic and parasympathetic nervous system anatomy, physiology, neurotransmitters, and innervation.
3. Describe the anatomy and physiology of the special senses, with special emphasis on the eye and the ear.
4. Describe the anatomical and functional differences between neurons and neuroglia.
5. Differentiate between motor, sensory and internuncial neurons as well as their functions and roles in the reflex arc.
6. Describe nerve impulse generation and the events that occur at the synapse.
7. Identify the anatomical structures of the brain and describe their functions.

Course Outcome(s):
Apply the fundamental knowledge of the circulatory system of the canine, feline, equine, bovine, ovine, porcine and avian species when working in biomedical research, veterinary medicine, animal agriculture or other advanced scientific study.

Objective(s):
1. Describe the normal anatomy of the heart.
2. Describe the physiology of the cardiac cycle.
3. Trace the normal circulatory route through the heart.
4. Describe the principles of electrocardiography and identify the major features of an ECG.
5. Describe the structure and function of the blood vessels.
6. Explain the principles of blood pressure, tissue perfusion, and peripheral resistance.

Course Outcome(s):
Apply fundamental knowledge of cellular biology, tissues and membranes, and the integumentary, and endocrine system of the canine, feline, equine, bovine, ovine, porcine and avian species when working in biomedical research, veterinary medicine, animal agriculture or other advanced scientific study.

Objective(s):
1. Describe the structure and function of cells and their organelles.
2. Describe the four types of tissues.
3. Describe the structure and functions of the skin, hair, claws, nails and horns.
4. Identify the external and internal anatomical structures of the hoof.
5. Describe the general actions of hormones on the target organs, including secondary messengers, cellular receptors, and feedback mechanisms.
6. Describe the various endocrine tissues, their hormones, target organs, and target organ responses, including clinical applications.

Methods of Evaluation:
1. Objective lecture examinations
2. Practical laboratory examinations
3. Lecture quizzes
4. Laboratory quizzes
5. Participation
6. Journal article summary
7. Research paper

Course Content Outline:
1. Chemical Basis for Life
   a. Organic Molecules
   b. Carbohydrates
   c. Lipids
   d. Proteins
   e. Nucleic Acids
2. Cellular biology
   a. Cell structures
      i. plasma membrane
      ii. cytoplasm/organelles
      iii. nucleus
   b. Cell physiology
      i. pinocytosis/phagocytosis
      ii. diffusion
      iii. osmosis
      iv. active transport
3. Tissues
   a. epithelium
   b. connective tissue
   c. muscle tissue
   d. nervous tissue
   e. membranes
      i. mucous
      ii. serous
      iii. synovial
      iv. cutaneous
4. Integumentary system
   a. Structure of the skin
      i. epidermis
      ii. dermis
b. Epidermal outgrowths
   i. hooves
   ii. claws
   iii. horns

5. Skeletal system
   a. Bone/cartilage microscopic anatomy
      i. compact bone/Haversian system
      ii. cancellous bone/trabeculae
   b. Bone gross anatomy
      i. cancellous bone
      ii. compact bone
      iii. long bones
      iv. flat bones
      v. irregular bones
   c. ligaments
   d. Bone homeostasis
      i. hormones
      ii. vitamins
      iii. minerals
   e. Bone growth
      i. growth in length/epiphyseal plate
      ii. growth in diameter/osteoblasts
      iii. osteocytes
      iv. bone healing
   f. Skeletal anatomy
      i. axial skeleton
      ii. appendicular skeleton
      iii. clinically important landmarks

6. Muscular system
   a. Microscopic anatomy
      i. skeletal muscle
      ii. smooth muscle
      iii. cardiac muscle
      iv. sarcomeres
   b. Muscle physiology
      i. depolarization
      ii. repolarization
      iii. neurotransmitters
      iv. actin
      v. myosin
      vi. troponin
      vii. tropomyosin
      viii. roles of Na, K, and Ca
      ix. contraction/sliding filament theory
      x. relaxation
      xi. tonus
      xii. clonus
      xiii. tetany
      xiv. oxygen debt/lactic acid
   c. Muscle anatomy
      i. head, neck, and trunk
         1. Major muscle groups
         2. muscle actions
         3. origins/insertions
         4. clinical landmarks
      ii. pectoral limb
         1. major muscle groups
         2. muscle actions
         3. origins/insertions
4. clinical landmarks
5. stay apparatus (equine)

iii. pelvic limb
1. major muscle groups
2. muscle actions
3. origins/insertions
4. clinical landmarks
5. stay apparatus (equine)

7. Nervous system
a. Cellular anatomy
   i. neurons
   ii. neuroglia
   iii. soma
   iv. dendrite
   v. axon
   vi. neurolemma
   vii. Schwann cell
   viii. myelin sheath
   ix. node of Ranvier
   x. motor end plate
   xi. motor neurons
   xii. sensory neurons
   xiii. internuncial neurons
b. Neuron physiology
   i. membrane potential
   ii. resting potential
   iii. threshold stimulus
   iv. action potential
   v. refractory periods
   vi. "all-or-none" principle
   vii. synapses
   viii. conduction velocity
   ix. inhibition/excitation
   x. neurotransmitters
c. Central nervous system
   i. definitions
      1. nucleus
      2. ganglion
      3. tract
      4. nerve
   ii. brain
      1. lobes
      2. fissures
      3. sulci/gyri
      4. cerebrum
      5. cerebellum
      6. thalamus
      7. hypothalamus
      8. pons
      9. medulla
     10. CSF/choroid plexus
     11. ventricles
     12. cranial nerves
     13. meninges
   iii. spinal cord
      1. white matter
      2. gray matter
      3. sensory pathways
4. motor pathways
5. reflex arc
d. peripheral nervous system
   i. endoneurium
   ii. perineurium
   iii. epineurium
   iv. receptor
   v. dorsal root
   vi. dorsal root ganglion
   vii. dorsal gray horn
   viii. ventral gray horn
   ix. ventral root
   x. effector
   xi. spinal reflexes
   xii. nerve plexuses
   xiii. clinical applications
e. Autonomic nervous system
   i. sympathetic vs. parasympathetic
   ii. preganglionic/postganglionic fibers
   iii. neurotransmitters
   iv. sympathetic physiology
   v. parasympathetic physiology
   vi. comparison of sympathetic and parasympathetic structure and function
f. Special senses
   i. olfaction
   ii. gustation
   iii. vision
      1. structure of the eye
      2. physiology of the eye
   iv. hearing and equilibrium
      1. structure of the ear
      2. function of the ear
   v. proprioception
8. Endocrine system
   a. Hormones
      i. basic chemistry
      ii. mechanisms of action
   b. Hypothalamus
c. Pituitary
d. Thyroid
e. Parathyroid
f. Adrenal
g. Pancreas
h. Pineal
   i. Thymus
   j. Kidney
   k. Skin
   l. Prostaglandins
9. Circulatory system
   a. Heart
      i. anatomy
      ii. physiology of contraction
      iii. circulation
      iv. nervous and endocrine regulation
      v. ECG
   b. Vascular anatomy
      i. arteries
      ii. veins
iii. capillaries
iv. regulation of blood flow

Resources


Resources Other

University of Minnesota Veterinary Anatomy Website:
http://vanat.cvm.umn.edu/about.html accessed on 12/2/2019

Instructional Services

OAN Number:
Ohio Transfer Module TMNS

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