



Course Number and Title: BIO 151 Biology II

Campus Location:
Georgetown, Stanton

Effective Date:
2018-51

Prerequisite:
ENG 090 or ENG 091, SSC 100 or concurrent

Co-Requisites:
None

Course Credits and Hours:
4.00 credits
3.00 lecture hours/week
2.00 lab hours/week

Course Description:

This course includes a survey of biodiversity with an emphasis on evolutionary taxonomic trends, the structure and function of plants and animals, and ecology. Particular emphasis is placed on comparative anatomy and physiology of animals.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
None

Schedule Type:
Classroom Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Apply the principles of evolution in relation to biodiversity. (CCC 1, 2, 5, 6)
2. Describe the development and key characters of the phylum chordata. (CCC 2, 6)
3. Examine and describe the basic structure and function of animal tissues and systems. (CCC 2, 6)
4. Compare circulation and gas exchange in the Kingdom Animalia. (CCC 2, 6)
5. Compare nutrition and digestion in the Kingdom Animalia. (CCC 2, 6)
6. Compare osmoregulation and excretion in the Kingdom Animalia. (CCC 2, 6)
7. Compare the nervous system in the Kingdom Animalia. (CCC 2, 6)
8. Compare motility in the Kingdom Animalia. (CCC 2, 6)
9. Compare reproduction in the Kingdom Animalia. (CCC 2, 6)
10. Examine the development, structure, growth, and transport mechanisms of plants. (CCC 2, 6)
11. Describe the energy flow and chemical cycling in ecosystems. (CCC 2, 6)
12. Perform and analyze various lab activities related to organismal biology. (CCC 1, 2, 3, 6)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Apply the principles of evolution in relation to biodiversity.
 1. Describe the classification system from domains to species levels.
 2. Describe the species binomial name convention.
 3. Describe the types of evidence that is used to create phylogenetic trees.
 4. Explain how cladograms are built using ancestral and derived characters.
 5. Explain how cladograms represent hypotheses regarding evolution.
 6. Explain homologies and convergent evolution.
 7. Describe key characters and provide examples of the Domain Archaea, Bacteria, and Eukarya.
 8. Describe key characters and provide examples of the Kingdom Protista, Fungi, Plantae, and Animalia.
2. Describe the development and key characters of the phylum chordata.

1. Describe the early embryonic development of chordates.
2. Describe the distinguishing characteristics of phylum chordata: notochord, pharyngeal slits, dorsal hollow central nervous system, and post-anal tail.
3. List and describe the invertebrate chordates.
4. Describe the distinguishing characteristics of the subphylum vertebrata.
5. List the classes of the subphylum vertebrata, their distinguishing characteristics, and give examples of each: Agnatha, Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves, and Mammalia (including monotremes, marsupials, and placental mammals).
3. Examine and describe the basic structure and function of animal tissues and systems.
 1. Discuss the hierarchy of body organization from the level of cells to systems.
 2. List and describe the four major tissue types of animals.
 3. List the organ systems and their functions in mammals.
 4. Discuss homeostasis and explain how it is maintained by feedback systems.
4. Compare circulation and gas exchange in the Kingdom Animalia.
 1. Compare open and closed circulatory systems.
 2. Compare the structure and functions of the heart, and the circulatory routes through the heart and major vessels in fish, amphibians, and mammals.
 3. Describe the cardiac cycle of the heart in mammals.
 4. Compare the anatomy and physiology of respiration in major phyla.
5. Compare nutrition and digestion in the Kingdom Animalia.
 1. Define *herbivore*, *carnivore*, and *omnivore*.
 2. Define *ingestion*, *digestion*, *absorption*, and *elimination*.
 3. Identify the nutritional requirements of animals.
 4. Compare the digestive systems of major phyla.
 5. Compare intracellular digestion, extracellular digestion, and alimentary canal digestion.
 6. Describe the structure and function of alimentary canal and the accessory organs.
 7. List the major digestive enzymes and their action.
6. Compare osmoregulation and excretion in the Kingdom Animalia.
 1. Compare osmoconformers to osmoregulators.
 2. Describe the structure and function excretory systems in invertebrates.
 3. Describe the structure and function of the mammalian excretory system.
 4. Explain urine formation in mammals.
 5. List the nitrogenous wastes of the vertebrate classes.
7. Compare the nervous system in the Kingdom Animalia.
 1. Describe the structure of a neuron.
 2. Explain impulse transmission across a synapse.
 3. Compare the organization of the nervous system in invertebrates and vertebrates.
 4. Describe the major divisions of the vertebrate brain and their basic functions.
 5. Describe the sensory systems.
8. Compare motility in the Kingdom Animalia.
 1. Describe ciliary, flagellar, and amoeboid movement.
 2. List the functions of the skeleton.
 3. Differentiate among exoskeleton, endoskeleton, and hydroskeleton.
 4. Define *insertion*, *origin*, *flexion*, and *extension*.
 5. Describe how the skeletal muscles and bones aid in movement.
 6. Describe the contraction of a skeletal muscle fiber.
9. Compare reproduction in the Kingdom Animalia.
 1. Compare the characteristics of sexual and asexual reproduction, parthenogenesis, hermaphroditism, internal and external fertilization.
 2. List and state the functions of the reproductive structures of the human female and male.
 3. Discuss reproductive hormonal regulation in the male and female.
10. Examine the development, structure, growth, and transport mechanisms of plants.
 1. Differentiate between nonvascular and vascular plants, seedless and seed plants, gymnosperms and angiosperms, monocots and eudicots, and give examples of each.
 2. Discuss the alternation of generations in plant reproduction.
 3. Label the parts of a flower and state their function.
 4. Describe pollination and fertilization of cones and flowers.
 5. Describe embryo and endosperm development in plants.
 6. List and describe the structures of a seed.
 7. Discuss germination and seedling development.
 8. Describe the basic structure of a vascular plant.
 9. Define the three major plant cell types.
 10. Discuss the three major plant tissue systems.
 11. Describe the structure and functions of xylem and phloem.
 12. Differentiate between apical and lateral meristems, primary and secondary growth.
 13. List conditions affecting the vegetative growth of plants.
 14. Describe water and mineral movement in roots.

15. Explain the function of stomata as it relates to transpiration and photosynthesis.
11. Describe the energy flow and chemical cycling in ecosystems.
 1. Discuss factors that affect primary production in ecosystems.
 2. Describe the transfer of energy between tropic levels.
 3. Explain the biological and geochemical processes that cycle nutrients and water in ecosystems.
12. Perform and analyze various lab activities related to organismal biology.
 1. Perform various laboratory activities related to basic structure and function of animals, to circulation, gas exchange, nervous system, digestion, and the reproductive system in Kingdom Animalia.
 2. Perform various laboratory activities related to the structure, growth, and development of Kingdom Plantae.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

None

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.