

JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Principles of Biology II

Course Abbreviation and Number: BIO 1580

Credit Hours: 4

Course Type: Lecture/Lab

Course Description: Students will recognize, identify, describe, and classify representatives of the major phylogenetic and taxonomic groups of life on earth, surveying the three domains of life's biodiversity and the archaea, bacteria, protist, fungi, plant, and animal realms. Students will study evolutionary history and relationships, life cycles, reproductive strategies, morphology, anatomy, physiology, behavior, and ecological roles of representative organisms. Laboratory may include one or more outdoor experiences. This survey course is appropriate for both science and non-science majors.

Prerequisite: ENG 1510 and BIO 1550 or BIO 1570 or BIO 1575 or BIO 2510.

General Education Requirements Met

SUNY

Natural Sciences

JCC

Scientific Reasoning

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Identify the major episodes in the geological history of life, and compare and contrast major scientific theories which explain how life began on early Earth;
2. Identify, describe, and distinguish between the theories of natural selection and evolution, microevolution and macroevolution, and the modern synthesis of genetics and Darwinian evolution, and present examples of scientific evidence for each
3. Assess the manner by which modern systematics and phylogenetic study requires ongoing taxonomic revisions in the identification, naming, and classification of species
4. Identify, compare and contrast the evolutionary history, structure, function, and reproduction of the archaea and bacteria, and recognize the critical ecological and economic roles played by each of these distinctive domains of prokaryotic life on earth
5. Identify the major taxonomic groups of the Domain Eukarya based upon phylogenetic evidence and evolutionary relatedness, and describe each group based upon anatomy and physiology, ecological, and economic roles
6. Demonstrate an understanding of "alternation of generations" as it applies to life cycles and reproductive strategies within the botanical realm, including unicellular algae such as diatoms and dinoflagellates, the brown, red and green algae, and true plants
7. Evaluate and describe the evolutionary history and various adaptations for survival of plants from ancestral green algae to seedless, nonvascular plants (i.e. bryophytes) to seedless, vascular plants (i.e. ferns, horsetails) to modern seed plants (i.e. gymnosperms, angiosperms)
8. Compare and contrast the anatomical tissues and structures found in the roots, stems, leaves, and reproductive structures of primitive vascular plants, gymnosperms, monocots and herbaceous and woody dicots
9. Identify the economic and ecological roles of fungi and fungal-like protists, distinguish between the major fungal divisions, and demonstrate understanding of the asexual and sexual life cycles of each
10. Interpret the phylogenetic tree and cladistic analysis of the animal kingdom, identifying and understanding the significance of major branch points (i.e. presence or absence of tissues, radial or bilateral symmetry, presence of absence of body cavities, body cavity lined/unlined by mesoderm...)
11. Identify and differentiate among the various classes of invertebrates, with special emphasis on comparative anatomy, life cycles, evolutionary adaptations, and environmental and economic roles
12. Identify the major anatomical features that distinguish chordates from non-chordates and differentiate among the various classes of vertebrates with special emphasis on comparative anatomy, life cycles, evolutionary adaptations, and environmental and economic roles.
13. Comparatively describe the nutrition and digestive structures and systems of all major animal groups, with special emphasis on the anatomy and physiology of the human digestive system
14. Compare and contrast mechanisms animals use to reproduce (both asexual and sexual modes)

Topics Covered:

- Introduction to Life's Diversity – Tracing Evolutionary History and the Taxonomic Classification of Life
- The Origin and Evolution of Microbial Life: The Prokaryotes: Bacteria and Archaea
- Simple Eukaryotes: the Protists
- Kingdom Fungi
- Kingdom Plantae: Mosses, Ferns, Gymnosperms, and Angiosperms
- Plant Reproduction and Sexual Encounters of the Floral Kind
- Plant Structure, Function, and Development: Tissues, Roots, Stems, Leaves
- Kingdom Animalia: Sponges, Cnidarians, Annelids and other Worms, Molluscs, Arthropods, and Echinoderms
- Kingdom Animalia: The Chordates
- Animal Systems: Digestive, Reproductive, Respiratory, Circulatory
- Human Evolution
- Animal Behavior
- The Biosphere: Conservation Biology and Human Impacts on the Environment

Information for Students

- Expectations of Students
 - [Civility Statement](#)
 - [Student Responsibility Statement](#)
 - [Academic Integrity Statement](#)
- [Accessibility Services](#)

Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
- [Get Help: JCC & Community Resources](#)
- [Emergency Closing Procedures](#)
- Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0
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- Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.

Effective Date: Fall 2021