SYLLABUS

DATE OF LAST REVIEW: 02/2013

CIP CODE: 24.0101

SEMESTER: Departmental Syllabus

COURSE TITLE: Diversity of Organisms

COURSE NUMBER: BIOL-0225

CREDIT HOURS: 5

INSTRUCTOR: Departmental Syllabus

OFFICE LOCATION: Departmental Syllabus

OFFICE HOURS: Departmental Syllabus

TELEPHONE: Departmental Syllabus

EMAIL: Departmental Syllabus

KCKCC-issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE(S): BIOL0121, General Biology, or BIOL0135, Cell and Molecular Biology

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com for the required text for your particular class.

COURSE DESCRIPTION: This course, for biology majors, is a whole-organism approach to the evolution and diversity of life. Emphasis is placed upon structure/function relationships, phylogenetics and the roles of organisms within their ecosystems. This course includes both lecture and laboratory components.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

I. History of Life
II. Evolution and Speciation
III. Introduction to Systematics
IV. The Prokaryotes: Bacteria and Archaea
V. Diversity of Protista
VI. Diversity of Plants
VII. The Fungi
VIII. Diversity of Animals - Invertebrates
IX. Diversity of Animals - Vertebrates

EXPECTED STUDENT OUTCOMES:
A. The student will understand the process of evolution.
B. The student will become acquainted with systematics methods, including various philosophies and methods of describing the interrelationships of life on earth.
C. The student will appreciate the morphological and functional relationships of organisms.
D. The student will understand how organisms are adapted to their environment.

COURSE COMPETENCIES:

History of Life
1. The student will describe conditions on earth at the beginning of life.
2. The student will relate the major events and milestones that have occurred during the history of life on earth.

Evolution and Speciation
3. The student will explain how natural selection can lead to adaptation and diversity.
4. The student will describe how mutation and sexual reproduction produce genetic variation.
5. The student will discuss the various forces that can alter allelic frequencies in a population.
6. The student will relate the various definitions of “species.”
7. The student will compare and contrast allopatric and sympatric speciation.

Introduction to Systematics
8. The student will explain the binomial system of naming organisms.
9. The student will list the seven obligatory classification categories and explain their hierarchy.
10. The student will discuss the field of systematics, including the relationships between taxonomy and classification, and the data used in constructing phylogenetic trees.
11. The student will compare and contrast the traditional (evolutionary), cladistic and numerical phenetic schools of systematics to include comparisons of resultant phylogenetic trees.

The Prokaryotes: Bacteria and Archaea
12. The student will describe the general structure of bacteria, especially those characteristics important to their classification.
13. The student will compare and contrast the structures and functions of photosynthetic, chemosynthetic and heterotrophic bacteria.
14. The student will discuss the bases for classification of bacteria and their relationships with other organisms.
15. The student will relate the diversity of nutritional and metabolic adaptations in prokaryotes.
16. The student will learn where archaea can be found and the techniques required for identification.

Diversity of Protista
17. The student will discuss the role endosymbiosis has played in the evolution of the eukaryotic cell.
18. The student will identify specific plant-like protistans and describe their life cycles.
19. The student will describe life cycles of slime and water molds, and fungi and the bases upon which they are classified.
20. The student will describe life cycles of important protozoa and the bases upon which they are classified.

Diversity of Plants
21. The student will relate the adaptations necessary for plants to live on land.
22. The student will compare and contrast characteristics of non-vascular and vascular plants.
23. The student will discuss the evolution of seed plants and the impact this has had on other organisms.
24. The student will list the characteristics that distinguish the major groups of plants.

The Fungi
25. The student will differentiate among the major groups of fungi.
26. The student will discuss the life cycles of common fungi.
27. The student will explain the importance of fungi in nutrient cycling.

_Diversity of Animals – Invertebrates_
28. The student will discuss basic embryonic development of animals and the various body plans.
29. The student will explain how invertebrates are related to each other.
30. The student will describe basic characteristics of organisms in each phyla and explain the life cycle of representatives for each phyla.
31. The student will compare and contrast the different classes of arthropods.
32. The student will compare and contrast protostomes and deuterostomes.

_Diversity of Animals – Vertebrates_
33. The student will discuss the evolution of chordates.
34. The student will explain distinguishing characteristics of the five classes of vertebrates.
35. The student will recognize and be able to place common vertebrates in the correct order.

**ASSESSMENT OF STUDENT OUTCOMES:** Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

**SPECIAL NOTES:**
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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