

I. COURSE DESCRIPTION:

- A. Division: Science
Department: Biology
Course ID: BIOL 203
Course Title: Invertebrate Biology
Units: 4
Lecture: 3 hours
Laboratory: 3 hours
Prerequisite: BIOL 201

B. Catalog Description:

An introduction to the biology of invertebrate organisms emphasizing comparative anatomy, systematics, ecology, and evolutionary relationships among the major invertebrate phyla. This course is designed primarily for pre-professional and biology majors or others with an interest in an in-depth study of biology.

Schedule Course Description:

Comparative anatomy, systematics, ecology, and evolutionary relationships among the major invertebrate phyla.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon completion of this course, students should be able to:

- A. Describe the links between protistans and invertebrate phyla.
B. Identify the major characteristics of each of the major invertebrate phyla and explain how those characteristics relate to their selective environments.
C. Compare and contrast the anatomical, ecological, and evolutionary relationships of the major phyla of invertebrate organisms.
D. Explain the systematics of one specific invertebrate taxon chosen by the student.

IV. CONTENT:

- A. Origin of Invertebrates
1. Evolutionary Relationships to protistans
2. Issues of origin of multicellularity
3. Selective environments and diversification of invertebrate taxa
- B. Survey of Major Invertebrate Taxa
1. basal animal groups
a. protistans
b. porifera
c. coelenterates
d. platyhelminthes
e. mesozoa
2. worms
3. molluscs
4. lophophorates
5. deuterostomes
6. arthropods

- C. Invertebrate Functional Biology
 - 1. feeding
 - 2. locomotion
 - 3. respiration
 - 4. defense
 - 5. reproduction and life cycles
 - 6. development
- D. Lab Survey of Major Invertebrate Taxa
 - 1. observation and identification of key morphological characteristics of animal groups
 - 2. comparative dissections

V. METHODS OF INSTRUCTION:

- A. Interactive lecture, augmented by demonstration materials and audiovisual media presentations.
- B. Scientific paper - semester project.
- C. Reading assignments in the textbook and from scientific literature.
- D. Examination and dissection of preserved animal specimens.
- E. Lab writeups.
- F. Field trips.

VI. TYPICAL ASSIGNMENTS:

- A. Semester project: Write a scientific paper exploring the systematics of one specific invertebrate taxon chosen by the student.
- B. Construct an analytical key for a group of chosen vertebrates.
- C. Classify a chosen invertebrate to an appropriate phylum and justify the classification.

VII. EVALUATION:

- A. Methods of Evaluation
 - 1. Short answer and essay exams
 - a. Example: Discuss the diversity of digestive morphology in sponges as it relates to surface to volume relationships.
 - b. Example: Discuss the relationship between a burrowing habit in worms and the function of colic cavities.
 - 2. Lab written and practice exams
 - a. Example: Identify a selected organism to class or order.
 - b. Example: Explain the basis for a given classification system.
 - 3. Lab writeups
Example: Draw and label the internal structures of an earthworm.
 - 4. Semester project
Example: Select and explore the systematics of a selected invertebrate taxon, using at least three journal articles from the scientific literature as references in addition to the course textbook and auxiliary class handouts. Prepare a written report following the guidelines for a formal scientific paper.
- B. Frequency of Evaluation
 - 1. 3 lecture exams
 - 2. 3 lab exams
 - 3. 1 semester project

VIII. TYPICAL TEXTS:

- A. Anderson, D.T., ed. Invertebrate Zoology, 3rd ed. Oxford University Press. 1999.
- B. Barnes, R.S.K., P. Calow, P.J.W. Olive. The Invertebrates: a New Synthesis, 2nd ed. Blackwell Scientific Publications, 1993.
- C. Ruppert & Barnes. Invertebrate Zoology. Saunders Harcourt Brace, Inc. 1994.
- D. Wallace, Taylor & Litton. Invertebrate Zoology: A Laboratory Manual 5th ed. Burgess Publishers. 1994

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

- A. Dissection tools, such as scalpel and scissors
- B. Surgical gloves