



BROWARD COLLEGE COURSE OUTLINE

LAST REVIEW: 2010-2011

(i.e. 2003-2004)

NEXT REVIEW: 2015-2016

(i.e. 2008-2009)

STATUS: A

(A, I, D)

COURSE TITLE: General Zoology

COMMON COURSE NUMBER: ZOO2010

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS:

(Voc. Course ONLY)

Lecture: 48 Lab:

Clinic: Other:

PREREQUISITE(S): None

COREQUISITE(S): ZOO2010L

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 characters, maximum):*

Basic course pertaining to the development, anatomy, physiology, genetics, ecology and evolutionary relationships of the animal kingdom. Upon successful completion of this course, the students will be able to comprehend the basic zoological principles and processes of phylogeny, physiology, genetics and ecology.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): 4A
General Education Requirements – Associate in Science Degree (AS), meets Area(s): 4A
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

UNIT TITLES

1. Reading and Writing in the Zoological Sciences
2. Phylogeny, Physiology, and ecology of (a) Protozoa, (b) Porifera, (c) Cnidaria, and (d) Ctenophora
3. The Acoelomate and Pseudocoelomate Phyla
4. The Coelomates - Protostomia: Mollusca, Annelida, and Arthropoda
5. The Coelomates - Deuterostomia: Echinodermata and Chordates
6. The Vertebrates - Fishes
7. The Vertebrates - Amphibians and Reptiles
8. The Vertebrates - Birds
9. The Vertebrates - Mammals
- *10. Primates - Non-Human and Human

*Optional

*** Complete the following only if course is seeking general education status ***

GENERAL EDUCATION Competencies and Skills *:

In the box to the right of the Competency/Skill, enter all specific **student learning outcome** unit numbers, as indicated in the course outline (i.e. 1.1, 2.7, 4.2, 4.0 and 5.12) that apply.

Course must include <u>all</u> of the following:	
1. Read with critical comprehension**	1.0
2. Write clearly and coherently**	1.0
3. Demonstrate literacy as appropriate within a given discipline** a) Information Literacy b) Technology Literacy c) Workplace Literacy d) Cultural Literacy e) Quantitative Literacy f) Scientific Literacy g) Environmental Literacy	a)1.1,1.2,1.3 b)1.4 f) 2.0-10.0 g) 2.4, 4.10-4.11
4. Apply problem solving skills or methods to make informed decisions in a variety of contexts**	2.4, 4.10-4.11
Course must include at least <u>one</u> of the following:	
5. Differentiate between ethical and unethical behavior	
6. Demonstrate an understanding of the physical, biological, and social environments and how individual behaviors impact this complex system.	2.4. 3.2. 4.10-4.11. 7.10
7. Demonstrate an understanding of and appreciation for human diversities and commonalities.	2.4
8. Speak and listen effectively.	

**General Education Competencies and Skills endorsed by 2010-2011 General Education Task Force*

****Required Competencies**

1) Read with critical comprehension.

The student will be introduced to the basic texts, concepts, vocabulary, and methods necessary for developing an understanding of the discipline and meeting the required benchmarks as stated in the course outline.

2) Write clearly and coherently.

The student will demonstrate an understanding and mastery of subject matter in a variety of ways, including writing. Writing activities may include both graded and ungraded essays, short answer quizzes, summaries, reactions, journals, and various other reports.

3) Demonstrate and apply literacy across all the disciplines (indicate which ones apply).

- a) **Information literacy** means understanding how to locate needed information, using the appropriate technology for the task, managing and evaluating the extracted information and using it effectively and ethically.
- b) **Technology literacy** is the ability to responsibly and effectively use appropriate technology to access, manage, integrate, or create information, and/or use technology to accomplish a given task.
- c) **Workplace literacy** is having the appropriate knowledge and skills to communicate and work with others effectively and perform job duties, whether it is through the use of computers and/or other technology.
- d) **Cultural literacy** is recognizing, understanding, and appreciating the similarities and differences between one's own culture and the cultures of others through a study of the arts, customs, beliefs, values, and history that define a culture.

- e) **Quantitative literacy** is having the ability to formulate, solve and interpret mathematical/statistical operations and graphical/tabular representations to make informed decisions.
- f) **Scientific literacy** means understanding the methodology and application of the scientific process, the physical and biological worlds, and recognizing that scientific knowledge is continuously updated or revised as new information is discovered.

4. Apply problem-solving skills or methods to make informed decisions in a variety of contexts.

The student will use acquired skills or methods to recognize, analyze, adapt, and apply critical thinking to solve problems and make informed decisions.

EVALUATION:

In the box to the right of the Methods of Assessment, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 4.0, 4.2 and 5.12) that apply.

1. Portfolio	
2. Short essays	2.0-10.0
3. Research Papers	2.0-10.0
4. Group projects	2.0-10.0
5. Discussions (In class and online)	2.0-10.0
6. Multiple Choice tests	2.0-10.0
7. Presentations	2.0-10.0
8. Service Learning Projects	
9. Quizzes (pop, announced, etc.)	2.0-10.0
10. Take-home tests	2.0-10.0
11. Summaries, critiques, and analyses	1.0-10.0
12. Reaction papers	
13. Surveys	
14. Performance	
15. Short answer tests	2.0-10.0
16. Classroom debates and colloquia	
17. Blogs, wikis, web pages	
18. Other (Please explain)	

UNITS**Unit 1 Reading and Writing in the Zoological Sciences****General Outcome:**

- 1.0 The student shall be able to clearly communicate in writing information derived from course related readings the major concepts and themes in the biological sciences.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1 Demonstrate in writing the ability to analyze and extract data relevant to biology from course related readings.
- 1.2 Evaluate the validity of information from a variety of sources.
- 1.3 Demonstrate using diagrams, drawings, outlines, concept maps, and/or other methods connections among biological concepts.
- 1.4 Demonstrate the ability to use the appropriate technology to carry out course requirements.

Common Course Number: ZOO2010

Unit 2 Phylogeny, Physiology, and ecology of (a) Protozoa, (b) Porifera, (c) Cnidaria, and (d) Ctenophora

General Outcome:

2.0 The students will be able to categorize the classification of Protozoa, Porifera, Cnidaria, and Ctenophora, and assess the distinguishing Characteristics and importance of selected taxa.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 2.1 Analyze the evolutionary history, distinguishing characteristics and taxonomy of selected members of the Protozoa, Cnidaria, and Ctenophora.
- 2.2 Assess and evaluate unicellular organization in the Protozoa and its significance.
- 2.3 Compare and contrast the anatomical structure, locomotion, nutrition, osmoregulation, excretion, and reproduction of selected members of protozoan taxa.
- 2.4 Diagram the life cycles of selected protozoans, including species of economic or medical significance.
- 2.5 Evaluate and compare the levels of body organization and formation of the primary germ layers in the Porifera, Cnidaria, and Ctenophora.
- 2.6 Categorize the various canals systems of sponges and trace the flow of water through these systems.
- 2.7 Compare and contrast the components of sponge skeletons.
- 2.8 Identify the types of cells that compose sponge structure. Relate structure and function among these cells.

- 2.9 Interpret the life cycles of selected sponges, including asexual and sexual reproduction, gemmule formation, and larval forms.
- 2.10 Define and distinguish between polyp and medusa stages as they relate to classifying members of the Cnidaria.
- 2.11 Compare and contrast the body symmetry found in adult members of the Cnidaria and Ctenophora.
- 2.12 Interpret the anatomy and physiology of the cnidocyte and nematocyst and associated structures.
- 2.13 Interpret the nervous system of cnidarians and explain how it functions.
- 2.14 Diagram the life cycles of selected hydrozoans, scyphozoans, and anthozoans.
- 2.15 Explain coral reef formation and relate it to anatomy, physiology, and ecology of the various types of corals.
- 2.16 Compare and contrast characteristics distinguishing the Ctenophora and Cnidaria.

Common Course Number: ZOO2010

Unit 3 The Acoelomate and Pseudocoelomate Phyla

General Outcome:

3.0 The students will be able to assess and compare the life cycles of selected parasitic and non-parasitic acoelomates and pseudocoelomates.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 3.1 Evaluate the distinguishing characteristics of selected acoelomates and pseudocoelomates in order to compare and contrast anatomical structure, locomotion, nutrition, osmoregulation, excretion, nervous system, and reproduction.
- 3.2 Diagram the life cycles of selected parasitic and non-parasitic acoelomates and pseudocoelomates including, where applicable, hosts, mode of entry, and disease control.
- 3.3 Compare and contrast characteristics of acoelomate and pseudocoelomate taxa including Turbellaria, Monogenea, Digenea, Cestoda, Rotifera, Gastrotricha, and Nematoda.
- 3.4 Compare and contrast the body symmetry, level of organization, and development of the primary germ layers in the acoelomate and pseudocoelomate taxa.
- 3.5 Assess the distinguishing features and interpret the embryological development of the pseudocoelom.
- 3.6 Describe locomotion in the Nematoda as it relates to the presence of longitudinal muscles only combined with high hydrostatic pressure.

Common Course Number: ZOO2010

Unit 4 The Coelomates - Protostomia: Mollusca, Annelida, and Arthropoda and Other Selected Protostome Taxa

General Outcome:

4.0 The students will be able to compare and contrast anatomical, physiological, and ecological features of selected lesser protostomes, and selected taxa of the Mollusca, Annelida, and Arthropoda.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 4.1 Describe the distinguishing features and explain the embryological development of the coelom.
- 4.2 Assess the characteristics that differentiate the protostomes from deuterostomes.
- 4.3 Compare and contrast the distinguishing characteristics of selected taxa of molluscs, annelids, arthropods, and selected lesser protostomes to compare and contrast anatomy, locomotion, nutrition, circulation, nervous system, excretion, osmoregulation, reproduction, and development.
- 4.4 List and describe the layers of a molluscan shell and describe the shell, if any, in the various taxa of molluscs.
- 4.5 Define torsion as it relates to gastropods.
- 4.6 Define metamerism and evaluate its influence on annelid structure and function.
- 4.7 Define tagmatization.
- 4.8 Compare and contrast the types of respiratory structures of chelicerates.
- 4.9 Assess the structure of exoskeletons of arthropods and explain control of the molting process.

- 4.10 Cite some examples and ~~outline~~ diagram the life cycles of selected lesser protostomes, molluscs, annelids, and arthropods of ecological, economic, and medical importance.
- 4.11 Assess various methods of controlling insect pests.

Common Course Number: ZOO2010

Unit 5 The Coelomates - Deuterostomia: Echinodermata and Chordates**General Outcome:**

5.0 The students will be able to compare and contrast anatomical, physiological, and ecological features of echinoderms, chordates, and other selected lesser deuterostome taxa.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 5.1 Categorize development in deuterostomes and differentiate the major deuterostome taxa.
- 5.2 Compare and contrast the distinguishing characteristics of selected taxa of echinoderms, chordates, and other selected lesser deuterostome taxa, their anatomy, locomotion, nutrition, circulation, nervous system, excretion, osmoregulation, reproduction, and development.
- 5.3 Interpret the echinoderm water-vascular system and evaluate its functions.
- 5.4 Describe the series of activities involved when a sea star feeds on a bivalve.
- 5.5 Describe adult echinoderm body symmetry.
- 5.6 Compare and contrast types of pedicellariae in echinoderms.
- 5.7 Describe and explain the function of evisceration in sea cucumbers.
- 5.8 Assess and describe the four basic characteristics of the chordates.
- 5.9 Compare and contrast features of the Hemichordata, Urochordata and Cephalochordata as they relate to chordate evolution.

5.10 Trace the hypothetical ancestry and evolution of Chordata.

Common Course Number: ZOO2010

Unit 6 The Vertebrates - Fishes

General Outcome:

6.0 The students will be able to construct the evolution, physiology, and ecology of fishes and interpret why fish have been so successful in their environment.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 6.1 Categorize the evolution of fishes from extinct jawless fish to extant boney fish.
- 6.2 Evaluate the adaptations necessary to an aquatic life style.
- 6.3 Differentiate the primitive vertebrate features shared by fish.
- 6.4 Differentiate the type of scales found in fish to their evolution in fish and distinguish from which scales you may determine the age of fish.
- 6.5 Evaluate the various characteristics that separate the major groups of fish, and place within that grouping lampreys, hag fish, sharks, skates, rays, sturgeon, paddle fish, bowfins, eels, lung fish, and perch and bass.
- 6.6 Describe the basic caudal fin types found in fish and relate them to their phylogeny.
- 6.7 Relate the significance of the coelocanth to present day ichthyology.
- 6.8 Explain the phenomenon of buoyancy and how it relates to fish and how fish accomplish neutral buoyancy.
- 6.9 Examine the evolutionary development of lungs from the rete mirabile.
- 6.10 Describe the gill structure of modern fish.
- 6.11 Analyze the external and internal anatomy of a modern boney fish.

6.12 Interpret the requirements for osmoregulation in salt water vs fresh water.

Unit 7 The Vertebrates - Amphibians and Reptiles**General Outcome:**

7.0 The students will be able to evaluate the significance of the transition of aquatic life to terrestrial environments and analyze the characteristics of amphibians and reptiles that allowed this transition.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 7.1 Evaluate the problems vertebrates had to overcome to adapt to a terrestrial environment from an aquatic one.
- 7.2 Categorize the characteristics of amphibians that enable them to live both an aquatic and terrestrial existence.
- 7.3 Trace the evolution of amphibians.
- 7.4 Characterize the major groups of amphibians and give examples of each.
- 7.5 Discuss the concept of neoteny in amphibians.
- 7.6 Describe the basic form of reproduction in the major groups of amphibians and relate this to egg type and development.
- 7.7 Compare and contrast reptiles with amphibians as to their success and/or failure in terrestrial environments.
- 7.8 Characterize the major reptilian groups and give examples of each.
- 7.9 Trace the phylogeny of the reptiles.
- 7.10 Compare and contrast various poison delivery systems found in reptiles and discuss the efficacy of each. Be able to recognize the major poisonous

reptiles in the United States and especially Florida.

- 7.11 Conclude how reptiles may use behavior as a means of thermoregulation.

Common Course Number: ZOO2010

Unit 8 The Vertebrates - Birds**General Outcome:**

8.0 The students will be able to assess the adaptation of vertebrates for flight and to be able to evaluate the relationships between birds and reptiles.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 8.1 Analyze the general characteristics of birds and contrast birds with reptiles.
- 8.2 Analyze the physics of flight and how it relates to Bernoulli's principle.
- 8.3 Compare and contrast the structural and functional adaptations of birds that enable them to provide high energy output in a body of low weight.
- 8.4 Trace the phylogeny of birds and relate that phylogeny to dinosaurs.
- 8.5 Categorize the major groups of birds.
- 8.6 Categorize how birds may navigate and migrate over long distances.
- 8.7 Distinguish the basic structure of a feather, name the various types found in birds and give their functions.
- 8.8 Describe the development of birds and relate this to the terms precocial and altricial.

Common Course Number: ZOO2010

Unit 9 The Vertebrates - Mammals**General Outcome:**

9.0 The students will be able to trace mammalian evolutions, and analyze the characteristics of mammals.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 9.1 Analyze the features that are distinctive to mammals and ~~relate~~ conclude how this allows for increased activity and care of their young.
- 9.2 Discuss mammalian thermal regulation.
- 9.3 Explain the significance of teeth, the types found in mammals, and be able to explain a dental formula.
- 9.4 Trace the development and give the function of the extraembryonic membranes and explain the significance of the placenta and its function.
- 9.5 Compare and contrast the various gland types found in mammals and characterize the mammary gland.
- 9.6 Appraise the major groups of mammals, characterize each and give an example of each.
- 9.7 Compare and contrast some behavioral mechanisms in mammals, especially in relation to reproduction.

Common Course Number: ZOO2010

Unit 10 Primates - Non-Human and Human

General Outcome:

10.0 The students will be able to place categorize humans in the primate scheme and trace the evolutionary development up to humans.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 10.1 Analyze the arboreal adaptations that led to the success of mammals.
- 10.2 Characterize the major taxa of primates.
- 10.3 Distinguish between old world monkeys and new world monkeys.
- 10.4 Trace the early evolution of primates and hominids.
- 10.5 Contrast humans and apes including bipedal gait, nuchal areas, tool usage, and social structure.
- 10.6 Discuss the contributions of Haeckel, Dubois, the Leakeys, and Walker.