



BROWARD COMMUNITY COLLEGE

COURSE OUTLINE

LAST REVIEW: 2002-2003

(i.e. 2003-2004)

NEXT REVIEW: 2007-2008

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

*Optional



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ASSESSMENT:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes.

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

GENERAL EDUCATION Competencies and Skills *:

Please highlight in green font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

1. Read with critical comprehension	
2. Speak and listen effectively	
3. Write clearly and coherently	
4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate)	1.3, 2.3, 4.9, 6.7, 7.6, 9.5
5. Demonstrate and apply literacy in its various forms: (highlight in green ALL that apply) (1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental)	(2) 3.10 (4) all objectives (6) 1.1, 4.10, 5.1, 6.3, 7.4, 9.4 (8) 1.15, 3.10, 6.10
6. Apply problem solving techniques to real-world experiences	3.11
7. Apply methods of scientific inquiry	
8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings	
9. Demonstrate an understanding of and appreciation for human diversities and commonalities	
10. Collaborate with others to achieve common goals.	
11. Research, synthesize and produce original work	
12. Practice ethical behavior	
13. Demonstrate self-direction and self motivation	
14. Assume responsibility for and understand the impact of personal behaviors on self and society	
15. Contribute to the welfare of the community	

** General Education Competencies and Skills endorsed by '05-'06 General Education Task Force*



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UNITS

Unit 1 Phylogeny, Physiology, and ecology of (a) Protozoa, (b) Porifera, (c) Cnidaria, and (d) Ctenophora

General Outcome:

- 1.0 The students will be able to explain the classification of Protozoa, Porifera, Cnidaria, and Ctenophora, and detail the distinguishing Characteristics and importance of selected taxa.

Specific Measurable Learning Outcomes:

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

- 1.1 Describe the evolutionary history, distinguishing characteristics and taxonomy of selected members of the Protozoa, Cnidaria, and Ctenophora.
- 1.2 Explain unicellular organization in the Protozoa and its significance.
- 1.3 Compare and contrast the anatomical structure, locomotion, nutrition, osmoregulation, excretion, and reproduction of selected members of protozoan taxa.
- 1.4 Outline the life cycles of selected protozoans, including species of economic or medical significance.
- 1.5 Describe the levels of body organization and formation of the primary germ layers in the Porifera, Cnidaria, and Ctenophora.
- 1.6 Explain the various canals systems of sponges and trace the flow of water through these systems.
- 1.7 Name and describe the components of sponge skeletons.
- 1.8 Identify the types of cells that compose sponge structure. Relate structure and function among these cells.



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- 1.9 Detail the life cycles of selected sponges, including asexual and sexual reproduction, gemmule formation, and larval forms.
- 1.10 Define and distinguish between polyp and medusa stages as they relate to classifying members of the Cnidaria.
- 1.11 Describe the body symmetry found in adult members of the Cnidaria and Ctenophora.
- 1.12 Detail the anatomy and physiology of the cnidocyte and nematocyst and associated structures.
- 1.13 Describe the nervous system of cnidarians and explain how it functions.
- 1.14 Trace the life cycles of selected hydrozoans, scyphozoans, and anthozoans.
- 1.15 Explain coral reef formation and relate it to anatomy, physiology, and ecology of the various types of corals.
- 1.16 Compare and contrast characteristics distinguishing the Ctenophora and Cnidaria.



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Unit 2 The Acoelomate and Pseudocoelomate Phyla

General Outcome:

- 2.0 The students will be able to understand and describe 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:

- 2.1 List the distinguishing characteristics of selected acoelomates and pseudocoelomates in order to compare and contrast anatomical structure, locomotion, nutrition, osmoregulation, excretion, nervous system, and reproduction.
- 2.2 Outline the life cycles of selected parasitic and non-parasitic acoelomates and pseudocoelomates including, where applicable, hosts, mode of entry, and disease control.
- 2.3 Compare and contrast characteristics of acoelomate and pseudocoelomate taxa including Turbellaria, Monogenea, Digenea, Cestoda, Rotifera, Gastrotricha, and Nematoda.
- 2.4 Describe the body symmetry, level of organization, and development of the primary germ layers in the acoelomate and pseudocoelomate taxa.
- 2.5 Describe the distinguishing features and explain the embryological development of the pseudocoelom.
- 2.6 Describe locomotion in the Nematoda as it relates to the presence of longitudinal muscles only combined with high hydrostatic pressure.



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Unit 3 The Coelomates - Protostomia: Mollusca, Annelida, and Arthropoda and Other Selected Protostome Taxa

General Outcome:

- 3.0 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:

- 3.1 Describe the distinguishing features and explain the embryological development of the coelom.
- 3.2 List the characteristics that differentiate the protostomes from deuterostomes.
- 3.3 List 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.
- 3.4 List and describe the layers of a molluscan shell and describe the shell, if any, in the various taxa of molluscs.
- 3.5 Define torsion as it relates to gastropods.
- 3.6 Define metamerism and discuss its influence on annelid structure and function.
- 3.7 Define tagmatization.
- 3.8 Name the types of respiratory structures of chelicerates.
- 3.9 Describe the structure of exoskeletons of arthropods and explain control of the molting process.
- 3.10 Cite some examples and outline the life cycles of selected lesser protostomes, molluscs, annelids,



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and arthropods of ecological, economic, and medical importance.

- 3.11 Describe various methods of controlling insect pests.



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Unit 4 The Coelomates - Deuterostomia: Echinodermata and Chordates

General Outcome:

- 4.0 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:

- 4.1 Describe development in deuterostomes and list the major deuterostome taxa.
- 4.2 List the distinguishing characteristics of selected taxa of echinoderms, chordates, and other selected lesser deuterostome taxa to compare and contrast anatomy, locomotion, nutrition, circulation, nervous system, excretion, osmoregulation, reproduction, and development.
- 4.3 Describe the echinoderm water-vascular system and list its functions.
- 4.4 Describe the series of activities involved when a sea star feeds on a bivalve.
- 4.5 Describe adult echinoderm body symmetry.
- 4.6 Compare and contrast types of pedicellariae in echinoderms.
- 4.7 Describe and explain the function of evisceration in sea cucumbers.
- 4.8 List and describe the four basic characteristics of the chordates.
- 4.9 Compare and contrast features of the Hemichordata, Urochordata and Cephalochordata as they relate to chordate evolution.
- 4.10 Trace the hypothetical ancestry and evolution of Chordata.



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Unit 5 The Vertebrates - Fishes

General Outcome:

- 5.0 The students will be able to relate the evolution, physiology, and ecology of fishes and explain 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:

- 5.1 Trace the evolution of fishes from extinct jawless fish to extant boney fish.
- 5.2 Recognize the adaptations necessary to an aquatic life style.
- 5.3 Discuss the primitive vertebrate features shared by fish.
- 5.4 Relate the type of scales found in fish to their evolution in fish and distinguish from which scales you may determine the age of fish.
- 5.5 Discuss 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.
- 5.6 Describe the basic caudal fin types found in fish and relate them to their phylogeny.
- 5.7 Relate the significance of the coelocanth to present day ichthyology.
- 5.8 Explain the phenomenon of buoyancy and how it relates to fish and how fish accomplish neutral buoyancy.
- 5.9 Describe the evolutionary development of lungs from the rete mirabile.
- 5.10 Describe the gill structure of modern fish.
- 5.11 Be able to describe the external and internal anatomy of a modern boney fish.



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5.12 Describe the requirements for osmoregulation in salt water vs fresh water.

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Unit 6 The Vertebrates - Amphibians and Reptiles

General Outcome:

- 6.0 The students will be able to explain the significance from the transition of aquatic life to terrestrial environments and describe 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:

- 6.1 Discuss the problems vertebrates had to overcome to adapt to a terrestrial environment from an aquatic one.
- 6.2 Name the characteristics of amphibians that enable them to live both an aquatic and terrestrial existence.
- 6.3 Trace the evolution of amphibians.
- 6.4 Characterize the major groups of amphibians and give examples of each.
- 6.5 Discuss the concept of neoteny in amphibians.
- 6.6 Describe the basic form of reproduction in the major groups of amphibians and relate this to egg type and development.
- 6.7 Compare and contrast reptiles with amphibians as to their success and/or failure in terrestrial environments.
- 6.8 Characterize the major reptilian groups and give examples of each.
- 6.9 Trace the phylogeny of the reptiles.
- 6.10 Describe 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.
- 6.11 Explain how reptiles may use behavior as a means of thermoregulation.



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Unit 7 The Vertebrates - Birds

General Outcome:

- 7.0 The students will be able to understand the adaptation of vertebrates for flight and to be able to characterize the relationships between birds and reptiles.

Specific Measurable Learning Outcomes:

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

- 7.1 Describe the general characteristics of birds and contrast birds with reptiles.
- 7.2 Explain the physics of flight and how it relates to Bernoulli's principle.
- 7.3 Discuss the structural and functional adaptations of birds that enable them to provide high energy output in a body of low weight.
- 7.4 Trace the phylogeny of birds and relate that phylogeny to dinosaurs.
- 7.5 Recognize the major groups of birds.
- 7.6 Discuss how birds may navigate and migrate over long distances.
- 7.7 Describe the basic structure of a feather, name the various types found in birds and give their functions.
- 7.8 Describe the development of birds and relate this to the terms precocial and altricial.



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Unit 8 The Vertebrates - Mammals

General Outcome:

- 8.0 The students will be able to trace mammalian evolutions, and discuss the characteristics of mammals.

Specific Measurable Learning Outcomes:

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

- 8.1 Discuss the features that are distinctive to mammals and relate how this allows for increased activity and care of their young.
- 8.2 Discuss mammalian thermal regulation.
- 8.3 Explain the significance of teeth, the types found in mammals, and be able to explain a dental formula.
- 8.4 Trace the development and give the function of the extraembryonic membranes and explain the significance of the placenta and its function.
- 8.5 Discuss the various gland types found in mammals and characterize the mammary gland.
- 8.6 Recognize the major groups of mammals, characterize each and give an example of each.
- 8.7 Discuss some behavioral mechanisms in mammals, especially in relation to reproduction.



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Unit 9 Primates - Non-Human and Human

General Outcome:

- 9.0 The students will be able to place 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:

- 9.1 Identify the arboreal adaptations that led to the success of mammals.
- 9.2 Characterize the major taxa of primates.
- 9.3 Distinguish between old world monkeys and new world monkeys.
- 9.4 Trace the early evolution of primates and hominids.
- 9.5 Contrast humans and apes including bipedal gait, nuchal areas, tool usage, and social structure.
- 9.6 Discuss the contributions of Haeckel, Dubois, the Leakeys, and Walker.