

Bergen Community College
Division of Mathematics, Science, and Technology
Department of Biology and Horticulture

Comparative Anatomy (BIO-221)

General Course Syllabus
Spring 2016

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| Course Title: | Comparative Anatomy (BIO-221) |
| Course Description: | This course is a study of the body structures of some representative vertebrate animals and of their functional and evolutionary relationships. Laboratory exercises include detailed dissection of the Lamprey eel, the dogfish shark, the mud puppy, the cat and other animals. |
| Prerequisites: | BIO-101 General Biology I, BIO-203 General Biology II |
| General Education Course: | No |
| Course Credits; | 4.0 |
| Hours per week: | 6.0: 3 hours lecture and 3 hours lab |
| Course Coordinator: | Robert Dill |
| Required Lecture Textbook: | <u>Comparative Anatomy of the Vertebrates</u> , Kent, George, C.V. Mosby Co., 9 th Edition ISBN 0-07-303869-5 |
| Required Laboratory Manual: | <u>Atlas and Dissection Guide for Comparative Anatomy</u> , Wischinitzer, Saul W. H. Freeman Co. Publisher, 6 th . Ed. 2007 ISBN 9780716769590 |

Student Learning Objectives:

The student will be able to:

1. Identify the basic concepts in comparative vertebrate anatomy and explain basic vertebrate characteristics. Assessment will be based on exam questions.
2. Identify and explain the anatomy and niche of the protochordates. Assessment will be based on exam questions.

3. Identify the major vertebrate groups and discuss the relationship between them. Assessment will be based on exam questions.
4. Identify the parts of the vertebrate integument and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
5. Identify the parts of the vertebrate skeletal and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
6. Identify the parts of the vertebrate limb and explain the relationship of this structure between major vertebrate groups. Assessment will be based on exam questions.
7. Identify the parts of the vertebrate muscular system and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
8. Identify the parts of the vertebrate digestive system and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
9. Identify the parts of the vertebrate respiratory system and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
10. Identify the parts of the vertebrate circulatory system and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
11. Identify the parts of the vertebrate urogenital system and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
12. Identify the parts of the vertebrate nervous system and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.
13. Identify the parts of the vertebrate endocrine system and explain the relationship of this system between major vertebrate groups. Assessment will be based on exam questions.

Laboratory Learning Objectives:

1. Identify the parts of the microscope and demonstrate proper use. Assessment will be based on lab quizzes and observation in the lab.
2. Identify and explain the basic chordate characteristics. Assessment will be based on lab quizzes and observation in the lab.
3. Identify and explain the anatomy and evolutionary significance of the protochordates. Assessment will be based on lab quizzes and observation in the lab.
4. Identify and explain the anatomy and evolutionary significance of the lamprey. Assessment will be based on lab quizzes and observation in the lab.
5. Identify and explain the anatomy and evolutionary significance of the protochordates. Assessment will be based on lab quizzes and observation in the lab.
6. Identify and explain the basic organ systems of the dogfish and how it relates to other vertebrate groups. Assessment will be based on lab quizzes and observation in the lab.
7. Identify and explain the basic organ systems of the mudpuppy and how it relates to other vertebrate groups. Assessment will be based on lab quizzes and observation in the lab.

8. Identify and explain the basic organ systems of the cat and how it relates to other vertebrate groups. Assessment will be based on lab quizzes and observation in the lab.

Student Assessment Tools:

The above student learning objectives will be generally assessed or evaluated by instructors using a variety of **assessment instruments** including **lecture exams, laboratory exams, quizzes, laboratory reports, written reports, presentations, projects, etc.** The decisions concerning the type or types and number of instruments that are used in a specific section of the course will be left to the instructor of that section. This information, when given by the instructor should be recorded by the student in the **Student Assessment Section** of this document.

COURSE CONTENT:

Lecture Topics:

| Unit | Topic | Chapter |
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| 1 | <u>Introduction:</u> The phylum chordata, the vertebrate body - general plan and Vertebrate characteristics - big four and satellite. | 1 |
| 2 | <u>Protochordates and the Origin of Vertebrates:</u> Protochordates, the origin of vertebrates, the ammocoete and an alternate theory of ammocoete-protochordate relationships. | 3 |
| 3 | <u>Parade of the Vertebrates:</u> Vertebrate taxa, Agnatha, chondrichthyes, osteichthyes, amphibia, reptilia, aves and mammals. | 4 |
| 4 | <u>Integument:</u> The epidermis, the dermis and dermal induction. The integument from fishes to mammals. | 6 |
| 5 | <u>An Introduction to the Skeleton:</u> Bone, Cartilage, Tendons, Ligaments and Joints, regional components of the skeleton and Heterotopic Bones. | 7 |
| 6 | <u>Skull and Visceral Skeleton:</u> The neurocranium, the generalized dermatocranium, the neurocranial complex - bony fishes and tetrapods and the visceral skeleton. | 9 |
| 7 | <u>Vertebrae, Ribs and Sterna:</u> The vertebral column, Ribs and Tetrapod sternum. | 8 |
| 8 | <u>Girdles, Fins, Limbs and Locomotion:</u> Pectoral girdles, pelvic girdles, fins and tetrapod limbs. | 10 |
| 9 | <u>Muscles:</u> Muscles Tissue, introduction to skeletal muscles. Axial, appendicular, branchiomic and integumentary muscles. Electric organs. | 11 |

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| 10 | <u>Digestive System:</u> The digestive tract, mouth and oral cavity, pharynx, esophagus, stomach, intestine, liver, pancreas and cloaca. | 12 |
| 11 | <u>Respiratory System:</u> Gills, Nares and Nasal canals, Swim bladder, lungs and their ducts. | 13 |
| 12 | <u>Circulatory System:</u> Blood, the heart of fishes, lung fishes, amphibians and amniotes. Arterial channels, Venus channels and Lymphatic system. | 14 |
| 13 | <u>Nervous System:</u> Spinal cord and spinal nerves and Brain and cranial nerves | 16 |
| 14 | <u>Sense Organs:</u> Special somatic receptors and special visceral receptors. | 17 |
| 15 | <u>Urogenital System:</u> Kidneys and their ducts, Urinary bladders, Genital organs and the cloaca. | 15 |

LABORATORY SCHEDULE:

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| 1 | Instructions, safety rules and microscopy and classification of the chordates |
| 2 | Anatomy of the Protochordates |
| 3 | Anatomy of the Lamprey |
| 4 | Anatomy of the Dogfish Shark, (Ex. 1, 2 & 3) |
| 5 | Anatomy of the Dogfish Shark, (Ex. 4, 5) |
| 6 | Anatomy of the Dogfish Shark, (Ex. 6 & 7) |
| 7 | Anatomy of the Dogfish Shark. (Ex. 8 & 9) |
| 8 | Anatomy of the Mud Puppy (<i>Necturus</i>),(Ex.1,& 3) |
| 9 | Anatomy of the Mud Puppy (Ex.4, 5, 6, & 7) |
| 10 | Anatomy of the Cat, (Ex. 1, 2, & 3) |
| 11 | Anatomy of the Cat, (Ex. 3 & 4) |
| 12 | Anatomy of the Cat, (Ex. 5 & 6) |
| 13 | Anatomy of the Cat, (Ex. 7, 8 & 9) |
| 14 | Anatomy of the Rabbit |
| 15 | Summary and Lab Final |

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| Student Assessment: | 1. Unit Examinations _____% |
| | 2. Quizzes _____% |
| | 3. Laboratory Work _____% |
| | 4. Report/Project _____% |
| | 5. Class Participation _____% |
| | 6. Other _____% |
| | 7. Total 100% |

At the discretion of the instructor, assessment measures may be somewhat modified.

If you have a medical condition or develop a medical condition during this semester, which prevents you from fulfilling the requirements of this course, you must notify your physician. You and your physician must decide whether or not it is appropriate for you to remain in this course. If the decision is to remain in this course, please obtain a letter from your physician indicating that your continued participation in this course is appropriate and present it to the Department Chair.

Faculty Addenda: As per individual faculty member

Lecture Attendance: As per instructor;

Lab Attendance: As per instructor;

Policy Concerning Late Assignments: As per instructor;

Policy Concerning Make-Up Testing: As per instructor;

Safety Information: As per instructor and assigned exercise;

College Policies:

Student Responsibility

Students will be held responsible for reading all pertinent information in college publications regarding withdrawals, course drops, college deadlines, and tuition refunds. Students are responsible for compliance with the rules and regulations as stated in college publications.

Absence of Instructor

Students are expected to wait twenty minutes for a faculty member to come to class. If at the end of twenty minutes, the faculty member does not come, the students should sign an attendance sheet, which indicates the course, date, and time. A student should deliver the attendance sheet to the divisional office (A304) if between 9:00 a.m. and 5:00 p.m. or to the Evening Office (C107) if before 9:00 a.m. or after 5:00 p.m. Students cannot be penalized by faculty for not waiting longer than twenty minutes.

Academic Dishonesty and Plagiarism

Bergen Community College is committed to academic integrity – the honest, fair and continuing pursuit of knowledge, free from fraud or deception. Students are responsible for their own work. Faculty and academic support services staff will take appropriate measures to discourage academic dishonesty. **Plagiarism** is a form of academic dishonesty and may be a violation of U.S. Copyright laws. Plagiarism is defined as the act of taking someone else's words, opinions, or ideas and claiming them as one's own.

Consequences of Violations Academic Integrity

A. Instructor's Sanctions for a Violation

The faculty member will determine the course of action to be followed. This may include:

- Assigning a failing grade on the assignment;
- Assigning a lower final course grade;
- Failing the student in the course
- Other penalties appropriate to the violation;

In all cases, the instructor shall notify the Vice President of Student Services of the violation and the penalty imposed. The student has the right to appeal the decision of the instructor to the appropriate department head.

B. Institutional Sanctions for Violations

When a violation of academic integrity has been reported regarding a student, the Vice President of Student Services may impose disciplinary penalties beyond those imposed by the course instructor, which may include suspension or dismissal from the College. The student shall have the right to a hearing before the Vice President of Student Services or a designated judicial affairs committee. Judicial procedures governing violations of academic integrity are contained in the student handbook.

Class Attendance

All students are expected to attend punctually every scheduled meeting of each course in which they are registered. Attendance and lateness policies and sanctions are to be determined by the instructor for each section of each course. These will be established in writing on the individual course outline. Attendance will be kept by the instructor for administrative and counseling purposes.

Eating and Drinking

Eating or drinking in classrooms, lecture rooms, laboratories, gymnasium, swimming pool, or passageways is forbidden. Covered beverages only are permitted in the library. Eating and drinking are permitted in cafeteria and vending areas only.

Learning Assistance

Henry and Edith Cerullo Learning Assistance Center

The Tutoring Center, English Language Resource Center, Math Walk-In Center and Writing Center are collectively known as the Henry and Edith Cerullo Learning Assistance Center. The Cerullo Learning Assistance Center is located in the Pitkin Education Building, in Room L-125. The telephone number is (201) 447-7489. The Learning Assistance Center, staffed with peer and professional tutors, offers free individual and group tutoring, supplemental instruction, and online tutoring for subjects offered at the College. The Center provides alternative approaches to problem solving and organizational skills. Tutors help clarify classroom lectures and textbooks and help students prepare for exams. These services build student self-confidence and reduce fear of failure. The Center is equipped with the latest technology and software, including tapes, books, review sheets, exercises and software.

Services for Students with Disabilities

Bergen Community College aims to create inclusive learning environments where all students have maximum opportunities for success. Any student who feels he or she may need an accommodation based on the impact of a disability should contact the Office of Specialized Services at 201-612-5269 or via email at ossinfo@bergen.edu for assistance.

Sidney Silverman Library

Main Building, Pitkin Education Center, L-wing, 2nd Floor.

Paramus Library Hours: (201) 447-7131 or visit <http://www.bergen.edu/library/calendar/gcal.htm>

Paramus Service Desk: (201) 447-7970

Meadowlands Location: 1280 Wall Street, Lyndhurst 2nd Floor

Meadowlands Library Hours: <http://www.bergen.edu/library/calendar/gcal.htm>

Meadowlands Service Desk: (201) 301-9692

www.bergen.edu/library

Testing Services

The Bergen Community College Office of Testing Services (OTS) is located in Room S-127. OTS serves the college community by identifying, developing, procuring, administering, processing, and/or evaluating examinations, which meet a variety of administrative and instructional needs. To contact the OTS, please call (201) 447-7202. The Office of Testing Services administers makeup tests as a service for students who, for compelling and exceptional reasons, have missed a scheduled classroom examination. Students must receive prior permission from and make arrangements with their course instructors to take these examinations, under specific conditions, in the Office of Testing Services, Room S-127.

WebAdvisor

WebAdvisor is a web interface that allows students to access information contained in Datatel's Colleague, the administrative database used by Bergen Community College. Students may use WebAdvisor to register for classes, to pay tuition and fees, to view their class schedules, to check grades, to check on progress toward degree requirements, etc. WebAdvisor accounts are available for all students enrolled in credit programs. New students are strongly encouraged to attend an in-person registration or advisement session before using a WebAdvisor account. Eligible students without WebAdvisor user names and passwords may access their WebAdvisor account by going to go.bergen.edu and selecting "I'm new to WebAdvisor." Then, follow the on-screen directions. Check the WebAdvisor FAQ for answers to common questions, such as how to reset your password. Students must have a valid e-mail address on file with the College to use WebAdvisor