General Biology II (BIO-203)

General Course Syllabus

Course Title: General Biology II (BIO-203)

Course Description: This course explores the evolution and biodiversity of representative organisms in the plant and animal kingdoms. Studies of plants investigate diversity, structure, and the physiology of absorption, transport, and photosynthesis. Students will examine the structure and life cycles of invertebrate and vertebrate animals. In a unit on Ecology, students will learn how living organisms interact with their environment. Laboratory exercises utilizing observation, experimentation, microscopy, and dissections provide practical demonstrations of the topics covered in lecture.

Prerequisites: BIO 101 General Biology I

General Education Course: Yes

Course Credits: 4.0

Hours per week: 6.0: 3 hours lecture and 3 hours lab

Course Coordinator: Louis Crescitelli


Supplementary Materials: Dissecting Kit (Recommended)
Student Learning Objectives:

The student will be able to:

1. Survey the biodiversity that exists in the plant and animal kingdoms.

2. Students will apply the scientific method of inquiry to gather and analyze biological data.

3. Develop laboratory skills, including the examination of living material, using the microscope, dissecting, and performing experiments to study physiological processes.

4. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

4. Identify the characteristics of the Plant Kingdom that distinguish plants from organisms in other Kingdoms.

5. Become aware of the diversity of the Plant Kingdom by completing an evolutionary survey of plant groups.

6. Investigate the adaptations that enabled plants to make the evolutionary transition from living in water to living on land.

7. Analyze the life cycles of plants and understand the concept of Alternation of Generations.

8. Examine key trends in the evolution of lower plants to higher plants, including the shift from dominance of the gametophyte to dominance of the sporophyte, and the shift from dependence of the sporophyte upon the gametophyte to dependence of the gametophyte upon the sporophyte.

10. Investigate the structure and function of plant organs including roots, stems, leaves, and flowers.

11. Analyze physiological processes in plants, including photosynthesis, absorption of water and minerals, and transport of water and minerals and carbohydrates.

12. Identify the characteristics that distinguish animals from organisms in other Kingdoms and understand how they are used to classify animals.

13. Trace the evolution and diversity of invertebrate and vertebrate animals by way of an evolutionary survey.

14. Investigate the structure and physiological processes of representative animals.

15. Identify the evolutionary advancements and adaptations to the environment that have given particular animals advantages in occupying and utilizing niches in their environment.
16. Examine the process of reproduction and trace the life cycles of representative animals.

17. Identify the levels of organization of ecology, including populations, communities, ecosystems, biomes, and the biosphere.

18. Analyze the interactions between living organisms and physical factors (temperature, light, and moisture) as well as biotic factors (other living organisms) in their environment.

19. Examine the importance of biological principles such as evolution, biodiversity, and ecology to society.

**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:**

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<th>Topic</th>
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<td>1.</td>
<td>Introduction to the Plant Kingdom</td>
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<td>566-589</td>
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<tr>
<td></td>
<td>Definition of a Plant</td>
<td>26</td>
<td>567</td>
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<tr>
<td></td>
<td>Characteristics of Plants</td>
<td>26</td>
<td>567-569</td>
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<tr>
<td></td>
<td>The Importance of Plants</td>
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<td>Economic Importance</td>
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<td>Ecological Importance</td>
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<td>Classification of Plants</td>
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<td>Major Plant Groups</td>
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<td>Ancestors of Plants – Green Algae</td>
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<td>Nonvascular Plants</td>
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<tr>
<td></td>
<td>Ferns</td>
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<tr>
<td></td>
<td>Gymnosperms</td>
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<td>Angiosperms</td>
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<td></td>
<td>Evolutionary Trends in the Plant Kingdom</td>
<td>26</td>
<td>567-569</td>
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<tr>
<td>2.</td>
<td>Structure and Life Cycles of non-vascular land plants</td>
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<td>569-572</td>
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<td></td>
<td>Structure and Life Cycles of non-seed vascular plants</td>
<td>26</td>
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<td></td>
<td>Structure and Life Cycles of Gymnosperms</td>
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<td>3.</td>
<td>Diversity of Angiosperms</td>
<td>26</td>
<td>582-585</td>
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<td>Monocots and Dicots</td>
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<td>584</td>
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### Angiosperm Life Cycle

<table>
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<th>Section</th>
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<tr>
<td>Reproduction in Angiosperms</td>
<td>30 677-701</td>
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<tr>
<td>Structure of the Flower</td>
<td>30 679</td>
</tr>
<tr>
<td>Pollen and Egg Production</td>
<td>26 585</td>
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<tr>
<td>Embryo Sac Formation</td>
<td>26 584</td>
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<tr>
<td>Pollination and Fertilization</td>
<td>26 585</td>
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<tr>
<td>Embryo Development</td>
<td>30 681-686</td>
</tr>
<tr>
<td>Seeds and Fruits</td>
<td>30 686-688</td>
</tr>
<tr>
<td>Germination</td>
<td>30 692-694</td>
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<tr>
<td>Asexual Development</td>
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### Diversity of the Animal Kingdom

<table>
<thead>
<tr>
<th>Phylum</th>
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<tbody>
<tr>
<td>Phylum Porifera</td>
<td>27 600</td>
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#### Radiate Animals

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<tr>
<th>Subphylum</th>
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<tbody>
<tr>
<td>Cnidaria and Ctenophora</td>
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#### Phylum Platyhelminthes

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<tr>
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<td>Phylum Nemertea</td>
<td>27 602-603</td>
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<table>
<thead>
<tr>
<th>Subphylum</th>
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</thead>
<tbody>
<tr>
<td>Phylum Rotifera</td>
<td>27 603-604</td>
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</table>

#### Lophotrochozoaana

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<th>Pages</th>
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<tbody>
<tr>
<td>Phylum Mollusca</td>
<td>27 604-605</td>
</tr>
<tr>
<td>Phylum Annelida</td>
<td>27 606-608</td>
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</table>

<table>
<thead>
<tr>
<th>Subphylum</th>
<th>Pages</th>
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<tbody>
<tr>
<td>Lophophorates</td>
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<td>Bryozoa and Brachiopoda</td>
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#### Ecdysozoans

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<td>Phylum Nematoda</td>
<td>27 609-610</td>
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<tr>
<td>Phylum Arthropoda</td>
<td>27 610-613</td>
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<table>
<thead>
<tr>
<th>Subphylum</th>
<th>Pages</th>
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<tbody>
<tr>
<td>Coelomate Deuterostomes</td>
<td>27 614-615</td>
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<tr>
<td>Phylum Echinodermata</td>
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<tr>
<td>Phylum Hemichordata</td>
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#### Diversity of the Chordates

<table>
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<th>Subphylum</th>
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<tr>
<td>Characteristics</td>
<td>27 615-616</td>
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<tr>
<td>Subphylum Cephalochordata</td>
<td>28 622-623</td>
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<td>Subphylum Urochordata</td>
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<thead>
<tr>
<th>Subphylum</th>
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<tr>
<td>Subphylum Vertebrata</td>
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    Reptiles  28  630-634

11. Birds  28  634-637
    Mammals  28  637-647

12. Ecology
    Introduction to Ecology
    The Biosphere
    Levels of Organization in Ecology
    Population Ecology  38  912-933

13. Communities
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    Competition  39  936-939
    Predator-Prey Relationships  39  939-940
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    Mutualism
    Commensalism
    Parasitism
    Succession  39  948-950

14. Ecosystems
    Biogeochemical Cycles  39  950-955
    Energy Flow in Ecosystems  39  955-959

15. Biomes
    Human Impacts on the Biosphere  40  978-985

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<th>Exercise</th>
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<tr>
<td>1.</td>
<td>Liverworts and Mosses (Bryophyta)</td>
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<tr>
<td>2.</td>
<td>Ferns (Pterophyta)</td>
<td>15-23</td>
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<pre><code>| The Pine and Other Gymnosperms               |        |
</code></pre>
3. The Flower, Development of the Embryo 31-43

4. Fruits and Seeds 45-49
   Seed Germination and 51-53
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5. Survey of the Animal Kingdom
   Exercise 8
   The Sponges: Phylum Porifera 109-118
   Exercise 9
   The Radiate Animals: 119-135

6. Exercise 10 137-156
   The Flatworms
   Phylum Platyhelminthes

7. Exercise 12
   The Molluscs 169-186
   Exercise 13
   The Annelids 187-204

8. Exercise 11
   Nematodes and Four Small Protostome Phyla 157-168
   Exercise 14
   The Chelicerate Arthropods 205-210
   Exercise 15
   The Crustacean Arthropods 211-222
   Exercise 16
   The Arthropods: Myriapods and Hexapods 223-244

9. Exercise 17 245-260
   The Echinoderms

10. Exercise 18
    Phylum Chordata 261-269
    Subphylum Urochordata
    Subphylum Cephalochordata

   Exercise 19 271-291
    Phylum Chordata
    The Fishes-Lampreys, Sharks, and
    Bony Fishes

11. Phylum Chordata
    Exercise 20 293-303
12. Phylum Chordata
   Exercise 20
   Class Amphibia: The Frog
   Exercise 20 B Skeletal System 294-295
   Exercise 20 C Skeletal Muscles 299-303
   Exercise 20 D Digestive, Respiratory, and Urogenital Systems 304-306
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13. Exercise 21
    The Reptiles 315-319
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    Exercise 22
    The Birds 321-325

14. Symbiosis Laboratory Exercise Handout

15. Review and Clean up

Student Assessment:

A. Unit Examinations: number _____ ................. _____%

B. Laboratory Work ..................................... _____%

C. Reports/Projects .................................... _____%

D. Class Participation ................................... _____%

E. Other ..................................................... _____%

TOTAL ................................................. 100 %

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 S127. 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

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