

ESSEX COUNTY COLLEGE – BIOLOGY DEPARTMENT

COLLEGE BIOLOGY I  
BIO 101 / SECTION \_\_\_\_  
Course Syllabus



**Instructor:**

**Office:**

**Office Phone:**

**Office E-mail:**

**Office Hours:**

**Classroom:**

**Class Meeting Times:**

**Course Pre-requisite:** Grades of “C” or better in ENG 096 and RDG 096.

**Credit Hours: 4.0**

**Contact Hours: 6.0 Lecture: 3.0 Lab: 3.0**

**Other: N/A**

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**Required Textbook:**

Inquiry into Life, (text) 16<sup>th</sup> edition, by Mader; Published by McGraw-Hill , 2020

Inquiry into Life, (laboratory manual) 16<sup>th</sup> edition, published by McGraw-Hill, Create) 2020

ConnectPlus interactive learning platform by McGraw-Hill

PLEASE NOTE: The technology fee which is part of your tuition for an online or hybrid course provides you with an e-book and access to Connect.

**Course Description:** This course is designed to develop, from a conceptual approach, meaningful understanding of some fundamental principles as they relate to the living world. Particular emphasis is placed on the unity and diversity of life forms and their relationship to each other and to their environment. This course can be taken to satisfy the science requirement of non-science majors, and can be taken independent of, or before, or after BIO 102. Materials for the course can be found at <http://eccbiology.blogspot.com>.

**General Education Goals:** Bio 101 is affirmed in the following General Education Foundation Category: **Scientific Knowledge and Reasoning.** The corresponding General Education Goal is as follows: Students will use the scientific method of inquiry through the acquisition of scientific knowledge. BIO 101 also addresses the General Education Integrated Course Goal: Information Literacy, which is as follows: Students will address an information need by locating, evaluating, and effectively using information.

**Course Goals:** Upon successful completion of this course, students should be able to do the following:

1. Explain concepts of biological organization, classification and the process of science;
2. Explain the concepts of cellular structure and function of prokaryotic and eukaryotic cells;
3. Explain the concepts of evolution and describe the evidence that supports it;
4. Explain the concepts of the microbial life, viruses, protists and fungi;

5. Explain concepts of the evolutionary history of plants, classification of plants, plant organization, plant function and plant reproduction;
6. Explain concepts of evolutionary trends in the animal kingdom and the diversity of invertebrates and vertebrates in the world.
7. Explain the concepts of basic inorganic and organic chemistry;
8. Explain concepts of DNA structure and gene expression.
9. Explain concepts in biotechnology and genomic;
10. Explain the concepts of cellular division and the cell cycle.
11. Investigate a topic in biology or biochemistry and report the findings in a written or oral form.
12. Utilize microscopes, basic laboratory glassware and other laboratory equipment effectively as tools in carrying out experiments related to the areas describes above.

**Measurable Course Objectives:**

Upon successful completion of this course, students should **Performance** specifically be able to do the following:

1. Explain concepts of biological organization, classification and the process of science;
  - 1.1 Identify the basic characteristics of life;
  - 1.2 Distinguish between the levels of biological organization.
  - 1.3 Describe how living things are classified.
  - 1.4 Identify the components of the scientific method and define a hypothesis.
  
2. Explain the concepts of cellular structure and function of prokaryotic and eukaryotic cells;
  - 2.1 Explain why cells are the basic unit of life.
  - 2.2 Identify the key differences between prokaryotic and eukaryotic cells.
  - 2.3 Recognize the structure and function of the organelles within eukaryotic cells.
  
3. Explain the concepts of evolution and describe the evidence that supports it;
  - 3.1 Define biological evolution
  - 3.2 Describe evidence for evolution
  - 3.3 Define microevolution
  - 3.4 Define the five agents of evolutionary change
  - 3.5 Explain the four main observations that makeup Darwin's Theory of natural selection
  - 3.6 Identify the three types of natural selection
  - 3.7 Explain how adaptive radiation can lead to speciation
  
4. Explain the concepts of the microbial life, viruses, protists and fungi;
  - 4.1 Distinguish between the domain archae, bacteria, and Eukarya
  - 4.2 Identify the majors structural features of bacteria
  - 4.3 Describe bacterial reproduction and bacterial diseases of humans.
  - 4.4 Identify the structural features of viruses and their reproductive cycles
  - 4.5 Describe the general characteristics of a protest
  - 4.6 Describe the structural components of fungal body
  - 4.7 Explain how fungi obtain their nutrients

5. Explain concepts of the evolutionary history of plants, classification of plants, plant organization, plant function and plant reproduction;
  - 5.1 identify ancestral plant features that helped give rise to land plants
  - 5.2 Describe alternation of generations in plants
  - 5.3 Compare and contrast features and characteristics of nonvascular and vascular plants, gymnosperms and angiosperms.
  
6. Explain concepts of evolutionary trends in the animal kingdom and the diversity of invertebrates and vertebrates in the world.
  - 6.1 Identify the general characteristics of animals
  - 6.2 Describe the anatomy and life cycles of invertebrates in different phyla.
  - 6.3 Identify the four morphological characteristics unique to chordates
  - 6.4 Compare and contrast the characteristics of fish, amphibians, reptiles, birds and mammals.
  
7. Explain the concepts of basic inorganic and organic chemistry;
  - 7.1 Describe the structure of the atom and its components
  - 7.2 Use the periodic table to determine trends and relationships between elements
  - 7.3 Describe how elements are combined to form molecules and compounds
  - 7.4 Identify the different types of chemical bonds
  - 7.5 Identify acidic and basic substances
  - 7.6 Compare inorganic molecules to organic molecules.
  - 7.7 Identify the role of functional groups
  - 7.8 Describe the structures and functions of carbohydrates proteins, lipids, and nucleic acids
  
8. Explain concepts of DNA structure and gene expression.
  - 8.1 Describe the structure of DNA
  - 8.2 Explain how DNA replication occurs
  - 8.3 Describe RNA function in gene expression
  - 8.4 Identify causes of gene mutations
  - 8.5 Describe characteristics of cancer cells
  
9. Explain concepts in biotechnology and genomics;
  - 9.1 Describe the steps of forming recombinant DNA
  - 9.2 Identify ways in which humans benefit from biotechnology
  - 9.3 Identify the benefits of the human sequenced genome.
  
10. Explain the concepts of cellular division and the cell cycle.
  - 10.1 Describe the stages of the cell cycle
  - 10.2 Explain the steps of mitosis and the purpose of it.
  - 10.3 Describe the events of meiosis
  - 10.4 Explain the process of gamete production in males and females.

11. Investigate a topic in biology or biochemistry and report the findings in a written or oral form.
12. Utilize microscopes, basic laboratory glassware and other laboratory equipment effectively as tools in carrying out experiments related to the areas describes above.

**Methods of Instruction:** Instruction will consist of a combination of lectures and laboratory activities. Specifics regarding each method of instruction are as follows:

1. Lectures: Each week a new unit will begin with a lecture presentation. For each unit, the instructor will provide the students with a study package to assist them as the topics are presented. A study package usually consists of an objective sheet, a study outline, and a glossary of important terms. Lectures serve as an overview for the material in the weekly units. These lectures are presented in a PowerPoint format to help the students in organizing and mastering the topics of the week.
2. Laboratory activities: Laboratory activities, continuation of the lecture material, discussion and student feedback will take place during this session

**Class Requirements:** All students are required to:

1. Attend **ALL** lectures and lab sessions as required by the college policy. Absences or late arrivals negatively affect student understanding of the material and, therefore, performance in the course.
2. Take tests/exams in class and adhere to the test/exam schedule.
3. Take the quiz for each unit presented. These weekly quizzes will each be composed of questions covering material presented during the lecture, the laboratory and/or in the required reading material. The quizzes usually include a variety of question formats such as multiple choice, fill-in or matching questions. Often the student will be asked to label diagrams (e.g., label a drawing of a flower) or to write a short essay as part of these quizzes.
4. Students will complete a research paper as part of the course. The student will choose the topic for this research paper with the approval of the faculty member. The topic can be chosen from any material presented in the course. References for this paper will come directly from the internet only. The grade for this paper will be equal to one test grade.

**Grading:** Final course grades will be according to the following range:

90-100	A	70-76	C
87-89	B+	60-69	D
80-86	B	59-0	F
77-79	C+		

Grading Components	% of final course grade
<b>McGraw Hill's Connect (100 pts per unit)</b>	<b>10%</b>
Additional 10 point bonus for LearnSmart Modules before Unit Exam with minimum of 80%.	
<b>Weekly Unit Exams</b>	<b>90%</b>
6 exams will show evidence of the extent to which students meet the course objectives. 1 lowest grade dropped if student took 6 tests	

Please note the **following** items that pertain to grading in this course:

- Completing assigned reading and homework in a timely manner and contributing to class discussions will greatly enhance your chance of success in this course. Biology cannot be understood without doing a significant amount of outside study.
- There are NO MAKE-UP TESTS or EXAMS. If you complete all eight exams, you will be able to drop the lowest exam, *although you will not be able to drop exam 8.*
- In determining final course grades, consideration will be given to assignment completion and timely submission, class participation, weekly quizzes and laboratory exercises. Absences or lateness usually negatively affects student understanding of the material and, therefore, performance in this course.

**Academic Integrity:**

Dishonesty disrupts the search for truth that is inherent in the learning process and so devalues the purpose and the mission of the College. Academic dishonesty includes, but is not limited to, the following:

- plagiarism – the failure to acknowledge another writer's words or ideas or to give proper credit to sources of information;
- cheating – knowingly obtaining or giving unauthorized information on any test/exam or any other academic assignment;
- interference – any interruption of the academic process that prevents others from the proper engagement in learning or teaching; and

- fraud – any act or instance of willful deceit or trickery.

Violations of academic integrity will be dealt with by imposing appropriate sanctions. Sanctions for acts of academic dishonesty could include the resubmission of an assignment, failure of the test/exam, failure in the course, probation, suspension from the College, and even expulsion from the College.

**Student Code of Conduct:**

All students are expected to conduct themselves as responsible and considerate adults who respect the rights of others. Disruptive behavior will not be tolerated. All students are also expected to attend and be on time for all class meetings. No cell phones or similar electronic devices are permitted in class. Please refer to the Essex County College student handbook, *Lifeline*, for more specific information about the College's Code of Conduct and attendance requirements.

**Class Expectations:**

Some of the expectations that you, the students, may have of me, the instructor, and some of the expectations that I, the instructor, will have of you, the students, in this class are given below.

You may expect me to:

- Arrive to class on time and be prepared.
- Provide clear instruction.
- Respect you as individuals and encourage you to work hard.
- Grade each test/exam fairly on the quality of your completed test/exam and not on the amount of time and effort you spent preparing for the test/exam.
- Return graded tests in a timely manner.

**Class Expectations:**  
(continued)

I will expect you to:

- Concentrate exclusively on this course during class hours.
- Do not receive or make phone calls or text messages. **TURN OFF all cell phones and other electronic devices** (iPods, MP3s, etc.) **before entering the classroom.** If you use a cell phone in class, you must leave for the remainder of the class session and see me during my office hours before attending the next class. If you repeatedly forget to turn off your cell phone and it rings and interrupts the class, you must leave for the remainder of the class session and see me during my office hours before attending the next class.
- Arrive to class on time. Late students are responsible for all missed material. If you are repeatedly late, you must see me during my office hours to discuss this matter.
- Come to class prepared. Reviewing notes from the previous class, reading appropriate sections of the textbook, and completing homework will enormously increase your understanding of the topics covered in this course. It is especially *strongly* suggested that you do the homework in a timely manner!
- Ask questions. Questions should be asked in class or during my office hours. Please ask for help *before* you fall behind.

- Respect me and all of your classmates.
- Please note that **shorts, open toe shoes, food and drinks are NOT allowed in the laboratories.** These are part of laboratory safety precautions. Also **no food and drinks in the lecture rooms**

**Students with  
Special Needs:**

**Differently-abled Support Services**

Essex County College welcomes students with disabilities into all of the college's educational programs. It is the policy and practice of Essex County College to promote inclusive learning environments. If you have a documented disability, you may be eligible for reasonable accommodations in compliance with college policy, the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and/or the New Jersey Law against discrimination. Please note, students are not permitted to negotiate accommodations directly with Professors, Academic Chairpersons, and Deans. To request accommodations or assistance, please self-identify with the Office of Differently-abled Support Services. The office is located in the Student Development and Counseling Department at the Main Campus in Room 4122-I, and on Tuesdays at the West Essex Campus, Advisement Center. Contact us by telephone at 973-877-3071 or by email at [disability@essex.edu](mailto:disability@essex.edu).

Below is a TENTATIVE weekly schedule. This schedule is subject to change at any time. Please be aware of any changes that are announced in class by either contacting a classmate or else by contacting me via e-mail.

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**Class Meeting Schedule ( 1 class session = 2 hours and 50 minutes)**

<b>Week</b>	<b>Class Topics/Reading Assignments</b>	<b>Laboratory Activities</b>
1	Study of Life Ch 1, pp 1 – 17	Scientific Method (pp 1-8) Appendix C, pp 456-457 Appendix A, pp 461-464
2	The Cell: Structure & Function  Ch 3, pp 43-62 Membrane: Structure and Function Ch 4, pp 63-78	Laboratory Exercise 2, pp 9-26 Appendix B, pp 465  The Cell Structure and Function p 41-56 Laboratory Exercise 4, pp 43 – 55
3	Evolution of Life Ch 27, pp 533-559 Appendix B, pp A19	Laboratory Exercise 23, pp 317 – 334 Handout (protein clock)
4	Microbiology Ch 28, pp 561 – 580 Protists and Fungi Chap 29, pp 583-602	Microbiology Laboratory Exercise 24, pp 335 – 354
5	Plant Biology Ch 30, pp 603-621 Ch 9, pp 142-167 Ch 10, pp 168-188	Laboratory Exercise 25, pp 355-368 Laboratory Exercise 26, pp 369-382 Laboratory Exercise 9, pp 105-123 Laboratory Exercise 10, 125-142 Handout (Dichotomous key)



6	Animal Kingdom Ch 31, pp 622-649 Unit Exam #6	Laboratory Exercise 27, pp 383-400 Laboratory Exercise 28, pp 401-422
7	Chordates and Vertebrates Ch 32, pp 650-670	Laboratory Exercise 29, pp 423-442
8	The Molecules of Cells Ch. 2, pp. 18-42 Inorganic Chemistry pp 19- 29	Laboratory Exercise 4 pp 54-55
9	The Molecules of Cells Ch. 2, pp 18-42 Organic Chemistry Pp 29-42	Laboratory Exercise 3, pp 27-39  Periodic Table of Elements
10	DNA Structure and Gene Expression Ch. 25, pp 494-516	Laboratory Exercise 5, pp 57-76
11	Biotechnology and Genomics Ch. 26, pp 517-532	Handout (DNA Fingerprinting exercise)
12	Cell Division Ch. 5, pp 79-98	