**ESSEX COUNTY COLLEGE**

**Biology and Chemistry Division**

**BIO 101 *–* College Biology I**

**Course Outline**

**Course Number & Name:**  BIO 101 College Biology I

**Credit Hours:**  4.0 **Contact Hours:**  6.0 **Lecture:** 3.0 **Lab:**  3.0 **Other:**  N/A

**Prerequisites**:  Grades of “C” or better in ENG 096 and RDG 096

**Co-requisites:** None **Concurrent Courses:** None

**Course Outline Revision Date:** Fall 2010

**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.

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

1. use the scientific method to solve a problem; and
2. write a research paper on a topic in biology.

**Measurable Course Performance Objectives (MPOs)**: Upon successful completion of this course, students should specifically be able to do the following:

1. Use the scientific method to solve a problem:

1.1 *list the major steps of the scientific method;* and

1.2 *demonstrate the proper use of the scientific method in an laboratory exercise*

1. Write a research paper on a topic in biology:

2.1 *identify valid and appropriate internet sources to prepare a research paper;* and

2.2 *use the source material as evidence for the development of a research paper*

**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. Note: The objective sheet, the study guide, the glossary and the PowerPoint presentation can be found on the web page for the courses (see http://eccbiology.blogspot.com).

2. Laboratory activities: Laboratory activities, continuation of the lecture material, discussion and student feedback will take place during this session.

**Outcomes Assessment:** Test and exam questions are blueprinted to ensure that the objectives of the course are met by the students. Data is analyzed to determine the percentage of students who perform the scientific method correctly and the percentage of students who complete correct research papers.

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

1. Take the quiz for each unit presented. These weekly quizzes will be composed of questions covering material presented each week 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.
2. 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 courses. References for this paper will come directly from the internet only. The grade for this paper will be equal to one quiz grade.

**Methods of Evaluation:** Final course grades will be computed as follows:

 **% of**

**Grading Components final course grade**

* **Research Paper 10%**

The student will develop a research paper on an instructor-approved topic.

* Scientific Method Project  10%

One or more laboratory exercises will demonstrate the student’s ability to utilize the scientific method correctly in solving a problem, one of the course objectives.

* **Weekly Unit Exams**  **80%**

Unit exams will show evidence of the extent to which students meet the course objectives.

 **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; could result in a
* 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 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.

**Course Content Outline:** based on the texts **Inquiry Into Life**, 13th edition, by Sylvia Mader; 2010; IBSN #: 978-0-07-340344-1; and **Inquiry Into Life, Laboratory Manual**, 13th edition, by Sylvia Mader; 2010; IBSN #: 0-679-36074-1

**Unit Class Topics/Reading Assignments Laboratory Activities**

1 Introduction Microscope, Metric System

 Ch 1, pp 1 – 17

2 The Cell: Structure & Function The Cell (cheek, onion, Elodea)

 Ch 3, pp 45 – 66 Laboratory Exercise 2, pp 21 – 25

 Ch 4, pp 67 – 80 Laboratory Exercise 4, pp 43 – 55

 **Unit Exam #1**

3 Origin of Life Evolution

 Evolution & Taxonomy Laboratory Exercise 23, pp 307 – 314

 Ch 27, pp 541 – 568 Handout (protein clock)

 Appendix B, pp A12 – A13

 **Unit Exam #2**

4 Kingdoms Monera, Protista, Bacteria, Protista, Fungi

 Fungi & Viruses Laboratory Exercise 24, pp 323 – 344

 Ch 28, pp 569 – 600

 **Unit Exam #3**

5 Kingdom Plants I (Metaphyta) Laboratory Exercise 25, pp 345 – 358

 Anatomy & Physiology (optional)

 Ch 8, pp 128 – 130 & 139 Laboratory Exercise 26, pp 359 – 375

 Ch 9, pp 143 – 170 (optional)

 Ch 10, pp 171 – 191 Handout (Dichotomous key)

 **Unit Exam #4**

6 Kingdom Plants II Field Trip – Plants of ECC

 Taxonomy

 Ch 29, pp 601 – 618

 **Unit Exam #5**

7 Animal Kingdom – Invertebrates I Invertebrates

 Ch 30, pp 619 – 629 Laboratory Exercise 27, pp 377 – 394

 **Unit Exam #6** (hydra & roundworms)

 Laboratory Exercise 28, pp 402 – 408

 (earthworm)

**Unit Class Topics/Reading Assignments Laboratory Activities**

8 Animal Kingdom – Invertebrates II Invertebrates

 Ch 30, pp 629 – 632 & 636 – 644 Laboratory Exercise 28, pp 409 – 418

 Ch 31, pp 645 – 648 (crayfish & grasshopper)

 **Unit Exam #7** Laboratory Exercise 29, pp 419 – 424

 (starfish dissection)

 Film (Starfish & their Relatives)

9 Animal Kingdom III – Vertebrates Laboratory Exercise 29, pp 426 – 434

 Ch 31, pp 648 – 659 (frog dissection)

 **Unit Exam #8**

10 Inorganic Chemistry Laboratory Exercise 4, pp 56 – 57

 Ch 2, pp 19 – 29 (pH measurements)

 Appendix D, p A15 Handout (Atomic Weight exercise)

**Unit Exam #9**

11 Important Organic Compounds Laboratory Exercise 3, pp 29 – 41

 Ch 2, pp 30 – 44 Handout

**Unit Exam #10**

12 The Molecular Basis of Life: DNA/ Laboratory Exercise 5, pp 59 – 61

 Biotechnology; Mitosis (mitosis)

Ch 25, pp 501 – 524 Handout (DNA fingerprinting

Ch 5, pp 81 – 88 exercise)

Ch 26, pp 526 & 529 – 531

**Unit Exam #11**

13 Organismic Reproduction & Genetics Meiosis

Ch 5, pp 89 – 97 Laboratory Exercise 5, pp 68 – 69

Ch 22, pp 443 – 449 & 72 – 77

Ch 23, pp 469 – 486 Laboratory Exercise 19, pp 245 – 247

**Unit Exam #12** (starfish embryo development)

 Handout (Genetics & Natural Selection)

Note: *Approximately* 1 Unit is covered each week during the 15-week semester.