



DEPARTMENT OF SCIENCE
COURSE INFORMATION SHEET FOR
BIO101 – GENERAL BIOLOGY I

All members of the Science Department at Clinton Community College use the respective course template as a basis for their course syllabi. Faculty may, at their discretion, change the order of the course content or add course content.

COURSE NUMBER AND TITLE: BIO101 – General Biology I

COURSE SECTION: TBA

CONTACT HOURS: 5 **CREDIT HOURS:** 4

SEMESTER AND YEAR: TBA

INSTRUCTOR'S NAME, TELEPHONE NUMBER, EMAIL ADDRESS, OFFICE NUMBER, AND OFFICE HOURS: TBA

I. COURSE DESCRIPTION:

This course is the first of a two-semester introductory course covering some central biology concepts, including molecular and cellular bases of life, photosynthesis, cellular respiration, cellular reproduction, and introductory concepts of genetics, inheritance, and biotechnology. The laboratory includes basic laboratory skills such as safety, microscope use, and measurement, and reinforces topics discussed in lecture. There are three hours of lecture and one two-hour laboratory per week.

This course meets the SUNY General Education course requirements for natural sciences.

II. PREREQUISITE: Students receiving credit for BIO101 and/or BIO102 cannot receive credit for BIO100.

COREQUISITE: ENG101 – English Composition or equivalent

III. COURSE OBJECTIVES, SUNY GENERAL EDUCATION KNOWLEDGE AREA LEARNING OUTCOMES AND ASSESSMENT:

COURSE OBJECTIVES:

As the result of instructional activities, students will be able to:

1. Compare and contrast the structure and function of prokaryotic and eukaryotic cells.
 - Compare and contrast prokaryotic and eukaryotic cells
 - Compare and contrast plant and animal cell structures and their functions
2. Demonstrate the proper use of compound and dissecting microscopes.
 - Demonstrate the proper use of compound and dissecting microscopes

3. Explain the structure and function of the four major classes of macromolecules.
 - Describe cell membrane structure and function in active, passive, and membrane assisted transport
 - Explain the chemical composition of living systems including carbohydrates, proteins, lipids, and nucleic acids
 - Discuss levels of protein structure
 - Identify environmental conditions that affect enzyme activity
4. Explain the processes of photosynthesis and cellular respiration and their relationship to each other.
 - Describe how plants modify their environment (photosynthesis)
 - Describe the process of cellular respiration
 - Explain the relationship between photosynthesis and respiration
 - Describe the process of chemiosmotic phosphorylation
5. Explain how genetic information is stored in DNA and translated into protein.
 - Compare and contrast the molecular structures of DNA and RNA
 - Describe DNA synthesis
 - Describe transcription and translation
 - Describe the structure of chromosomes
6. Describe the mechanics of mitosis and meiosis and the relationship of these processes to reproduction and function.
 - Describe the beginning and ending products of mitosis, including the relationship of this process to growth, repair, and chromosome number
 - Identify and describe the stages for the cell cycle
 - Describe the beginning and ending products of meiosis, including the relationship of this process to reproduction, heredity, variation, and reduction of chromosome number
7. Apply genetic principles to simple Mendelian and non-Mendelian inheritance problems and concepts
 - Apply genetic principles to simple inheritance problems/concepts including monohybrid and dihybrid crosses
 - Describe non-Mendelian inheritance including incomplete dominance, codominance, multiple alleles, pleiotrophy, epistasis, genomic imprinting, polygenetic inheritance
 - Compare and contrast the relationship between mutations and genetic disorders
 - Use pedigrees/karyotypes to examine the inheritance of genetic disorders
8. Explain advantages and disadvantages of using genetic engineering techniques today in plants, humans and other animals and the ethical issues related to biotechnology.
 - Explain advantages and disadvantages of using genetic engineering techniques today in plants, humans and other animals
 - Discuss the bioethical issues related to biotechnology

SUNY GENERAL EDUCATION KNOWLEDGE AREA LEARNING OUTCOMES:

Students will demonstrate the ability to:

1. understand the methods scientists use to explore natural phenomena, including:
 - observation
 - hypothesis development
 - measurement and data collection
 - experimentation

- evaluation of evidence
 - employment of mathematical analysis
2. apply scientific data, concepts and models in one of the natural sciences

IV. REQUIRED TEXTBOOK AND MATERIALS:

REQUIRED TEXTBOOK:

Biology, 7th edition; Campbell. Benjamin Cummings
ISBN #0-805-37171-0

REQUIRED MATERIALS:

Safety glasses are required for all on-campus sections.

V. METHODS OF INSTRUCTION/COURSE ORGANIZATION: *To be determined by the respective instructor.*

VI. ATTENDANCE PROCEDURE (INCLUDING MAKEUP POLICY): *To be determined by the respective instructor.*

VII. BIBLIOGRAPHY OF READINGS (IF APPLICABLE): *To be determined by the respective instructor.*

VIII. METHODS OF EVALUATION (INCLUDING THE CALCULATION OF COURSE GRADE): *To be determined by the respective instructor. The methods of evaluation shall include tests (test types, length and weight of each), papers (weight of each), projects (weight of each), and other forms of evaluation (weight of each).*

IX. GRADING SCALE: *To be determined by the respective instructor. The grading scale shall indicate what numerical scores correspond to the following grades: A, A-, B+, B, B-, C+, C, C-, D+, D, and F.*

Please Include: If you have, or suspect you may have, any type of disability or learning problem that may require extra assistance or special accommodations, please speak to me privately after class or during my office hours as soon as possible so I can help you obtain any assistance you may need to successfully complete this course. You should also contact Laurie Bethka, Room 420M in the Academic Assistance Center, for further assistance.

X. GENERAL TOPICS OUTLINE:

1. Introduction to the Study of Life
2. Natural Selection
3. What is Science?
4. Chemistry
5. Organic Chemistry and Biochemistry
6. Cells
7. Membranes
8. Energy and Enzymes

9. Photosynthesis
10. Cellular Respiration
11. Mitosis
12. Cancer
13. Meiosis
14. Genetics
15. Human Genetics
16. DNA
17. Protein Synthesis: Transcription and Translation
18. Control of Gene Expression
19. Biotechnology

XI. ACADEMIC INTEGRITY: Academic honesty is expected of all Clinton Community College students. It is academically dishonest, for example, to misrepresent another person's work as one's own, to take credit for someone else's work or ideas, to accept help on a test, to obtain advanced information on confidential test materials, or to intentionally harm another student's chances for academic success.

XII. COURSE CONTINUITY PLAN: In the case that the college officially closes because of an emergency which causes a short term disruption of this course, we will utilize e-mail to continue this course in the short term (1-3 weeks). All students need to utilize their campus e-mail to receive course related information.