

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY  
BIO 101 - GENERAL BIOLOGY I (4 CR.)**

**Course Description**

Focuses on foundations in cellular structure, metabolism, and genetics in an evolutionary context. Explores the core concepts of evolution; structure and function; information flow, storage and exchange; pathways and transformations of energy and matter; and systems biology. Emphasizes process of science, interdisciplinary approach, and relevance of biology to society. Part I of a two-course sequence. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week. **This is a Passport Transfer Course.**

**General Course Purpose**

This course provides students with an opportunity to acquire fundamental knowledge of the principles and living systems and their applications to everyday life. The course is designed for both science and non-science majors. It may serve as a prerequisite for advanced biology courses, a laboratory science graduation requirement, or as transfer credit for a four-year institution.

**Course Prerequisites/Corequisites**

Prerequisites: Competency in Math Essentials Units MTT 1-3 as demonstrated through placement and diagnostic tests, or by completion through unit 3 in an MTT course. Competency in Math Essentials Units MTT 1-5 or equivalent is desirable. A student who provides official evidence of a minimum mathematics score of 520 on the SAT or a minimum score of 22 on the ACT taken within the last two years may register for these courses without taking the math placement test. Placement in ENG 111 required.

**Course Objectives**

Upon completion of this course, the student will be able to:

- Describe the fundamental importance of evolution as a unifying concept in biology
- Describe the major taxonomic groups of living organisms
- Apply the scientific method to investigate elementary biological problems
- Diagram and describe the atomic structure of biologically important elements
- Explain the principles of chemical bonding and apply those principles to the formation and properties of both inorganic and organic molecules
- Describe the structure and function of enzymes and their roles in metabolic pathways
- Diagram a typical plant, animal and prokaryotic cell and label the component parts of each and explain their function
- Describe the processes by which materials move across the cell membrane and within the cell
- Describe the main events of cell division and relate these to the formation of new cells
- Apply the basic principles of inheritance and probability to the solution of genetic problems
- Describe the molecular aspects of the storage, expression, and transmission of genetic information
- Describe the recent developments in genetics and relate these to human welfare
- State the Hardy-Weinberg Law and discuss its relevance to evolution
- Describe the main features of the modern theory of evolution

**Major Topics to be Included**

- Characteristics of life
- Scientific method
- Biological chemistry
- Cell structure
- Cell division (mitosis)

- Cell physiology
  - Transport
  - Metabolic processes
    - Glycolysis
    - Fermentation
    - Aerobic respiration
    - Photosynthesis
- Cell division (meiosis)
- Classical genetics
- Molecular genetics
- Population genetics
- Diversity of Life
- Evolution

### **Optional Topics**

Research projects, field trips, research papers and seminars may be available for interested students or for students who need these elements for a particular purpose. The optional elements may be offered at the instructor's discretion.