Learning Objectives

A. General Skills and Breadth

- Develop the ability to manage one’s time, work independently, take initiative, and collaborate.
- Develop the ability to think critically, analyze, synthesize, and use information to solve problems.
- Acquire broad knowledge in the humanities, social sciences, mathematics, and physical sciences, and understand the relevance of these disciplines to the biological sciences.
- Develop the ability to communicate scientific ideas, orally and in writing.
- Develop facility in the use of computer applications and the internet.

B. Scientific and Experimental Skills

- Understand and apply the scientific method, including forming hypotheses, designing experiments to test hypotheses, and collecting, analyzing, interpreting, and reporting data.
- Develop the ability to use appropriate laboratory or field procedures, methods, and instrumentation for biological studies.

C. Biological Skills

- Develop breadth of knowledge in the biological sciences, including the fields of biochemistry, cell biology, ecology, evolution, molecular biology and genetics, and physiology.
• Acquire an appreciation for all levels of biological organization, including the molecular, cellular, organismal, and systems levels.
• Understand the processes that underlie embryonic development, cellular differentiation, and reproduction.

1. Biochemistry

• Understand the structure and function of biological molecules, cellular energetics, cellular metabolism, and photosynthesis.

2. Cell Biology

• Understand the structure and function of prokaryotic and eukaryotic cells, as whole entities and in terms of their subcellular processes.

3. Ecology

• Understand the interactions between organisms and their environments, and the consequences of these interactions in natural populations, communities, and ecosystems.

4. Evolution

• Understand evolution as the central unifying concept in the biological sciences.
• Understand natural selection, and how it contributes to the formation of species, biodiversity, and patterns of biological evolution.
• Appreciate the scope of biological diversity in terms of the evolutionary history of the major groups of organisms.

5. Molecular Biology and Genetics

• Understand the synthesis, structure, and function of nucleic acids and proteins in prokaryotes and eukaryotes.
• Understand the principles of inheritance from molecular mechanisms to population consequences.
• Understand the flow of genetic information in populations and the relationship between genetics and evolutionary theory.

6. Physiology
- Understand the functioning of organisms, at the molecular, cellular, organ, and organismal levels.

D. Ethics / Society

- Be able to place biological knowledge into an ethical context, especially how biology can contribute to the resolution of ethical, social, and environmental issues.

E. After Graduation

- Prepare students with a sufficient depth of knowledge and abilities to prepare them for entry-level employment in a wide variety of fields, or for graduate study in the health professions or other biology-related disciplines.