Graduate Program in Biology: Program Goals and Student Learning Objectives

I. Ph.D. Program
Program Goal #1: Originate and advance research in their area of study
Student Learning Objectives:
• An ability to think critically and integrate biological principles at several levels of biological structure, organization, and dynamics, from basic mechanisms at the molecular, cellular, tissue, organismal, and population levels to complex phenomena and system behavior.
• Identification of specific research interests and projects.
• An ability to use appropriate learning strategies to acquire new knowledge, and synthesize this knowledge into a meaningful strategy of scientific inquiry.
• An ability to design approaches to biological phenomena by observation and experimentation with the appropriate technical skills and equipment, and to describe and analyze theses phenomena quantitatively.

Program Goal #2: Prepare to become leaders in academia, industry or the government
Student Learning Objectives:
• An ability to communicate and interact effectively with a range of audiences.
• An ability to coherently disseminate scientific findings in writing.
• An ability to recognize ethical, societal, and professional responsibilities in educational and mentoring settings and make informed judgments about didactics, communication, and inclusiveness.
• An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Program Goal #3: Progress as an apprentice scholar, and graduate as a colleague of their mentor(s).
Student Learning Objectives:
• An ability to identify, formulate, and solve complex biological problems by applying principles of quantitative analysis and biological sciences.
• Formulate a preliminary post-graduation career plan sufficiently early.
II. M.S. Program
Program Goal #1: Enhance the ability to integrate biological principles at several levels of biological structure, organization, and dynamics.
Student Learning Objectives:
- A mechanistic understanding of biological processes at the molecular, cellular, tissue, organismal, and population levels that give rise to complex phenomena and system behavior, explainable in the framework of cell theory and evolution.
- An understanding that structure and function in biology is quantifiable with physical and mathematical tools, applied in a diverse array of modern biological and interdisciplinary methodological approaches.

Program Goal #2: Enhance critical thinking skills and advanced scientific literacy
Student Learning Objectives:
- Understand the basic epistemological foundations of scientific knowledge and the practical application of the scientific method and learn to critically assess experimental results and interpretations of scientific findings.
- An ability to find, read, and critically analyze scientific literature and articulate its impact on biological/biomedical sciences and society.

Program Goal #3: Enhance professional, interpersonal, collaborative, and communication skills that result in the effective and ethical exchange of information and ideas.
Student Learning Objectives:
- An ability to review and effectively explain and express ideas and communicate and interact effectively with an audience, collaborators, and peers.
- An ability to coherently describe and discuss scientific findings in writing.
- Understand the core norms, principles, regulations, and rules governing the practice of research.