



University of California, Santa Barbara
Program Learning Outcomes

PhD in Biological Engineering

Students graduating with a PhD in Biological Engineering should be able to:

Core Knowledge

1. Demonstrate competency in fundamental areas of biological engineering including engineering of devices, model systems, and analyses; quantitative experimental design, computation and analysis; methods and modeling of molecular, cellular and physiological systems, biochemical processes, and biomedical devices.
2. Demonstrate expertise in one or more areas of Biological Engineering specialization.

Research Methods and Analysis

3. Apply an understanding of the current literature to new problems in biological engineering and related disciplines.
4. Identify fundamental research problems and propose innovative solutions to these problems.
5. Design and test new technologies and analytical methods that address defined needs for human health and the environment and specifications for implementation and translation.
6. Design and conduct well-controlled, hypothesis-driven experimental and/or computational studies.
7. Collect, analyze, and draw conclusions from experimental data or simulations

Pedagogy

8. Teach and mentor skillfully. This includes mastering techniques for effective lecturing as well as methods for guiding and assessing undergraduate students, including the ability to critically assess the quality of undergraduate preparation via exams and written assignments.

Scholarly Communication

9. Present (both orally and in writing) original research data into reports, publications and a coherent thesis, including:
 - The proper use of citations and references.
 - Compelling, critical reviews of prior published research.
 - A level and style of English and graphical communication that effectively contributes to understanding of the field by their peers.

Professionalism

10. Contribute technical advances to their scientific communities and relevant professional societies.
11. Demonstrate the cooperative and interdisciplinary nature of research in the biological engineering.

University of California, Santa Barbara
Program Learning Outcomes, continued

12. Maintain professional and ethical standards of research within the scientific community, and conduct themselves with honesty and in an ethical manner in all aspects of their careers.
13. Identify career options for biological engineers, and develop the workforce skills (team collaboration, communication, experimental and analytical skills) and credentials (publications, certifications) needed for industrial, policy, government and academic jobs.