NEASC Document

Department: Biochemistry
Degree: MS

LEARNING GOALS & OUTCOMES in the BS-MS and MS Programs

KNOWLEDGE:

- All students graduating with a Biochemistry BS-MS or MS degree should have knowledge of the following general areas:
  - Basic principles of cell biology.
  - Firm understanding of general chemistry and organic chemical reaction mechanisms, particularly in the area of carbonyl chemistry.
  - Molecular forces determining protein and nucleic acid folding and membrane assembly.
  - Mechanisms by which enzymes catalyze cellular chemical reactions.
  - Strategies by which cells store and transmit information in DNA and RNA.
  - Mechanisms for communicating changes in the extracellular environment to the cell’s interior.
  - Techniques for determining molecular structures of macromolecules.
  - Relation of impairment in macromolecular function to disease.
  - All students are required to carry out an original research project in the laboratory of a Brandies life-science faculty member, including writing a thesis that constitutes a significant research contribution
  - All students participate in full-time summer research

CORE SKILLS:

- Our MS program requires majors to use a set of basic skills to attack problems particular to biochemistry, some of which should be mastered through prerequisites taken even before encountering our introductory course. The core skills needed for the major are:
  - Facility with familiar mathematical functions, proficiency in univariate calculus, and understanding of basic elements of probability and statistics.
  - Familiarity with the application of calculus to problems in classical physics.
  - Mastery of basic principles of equilibrium thermodynamics and chemical kinetics.
  - Ability to read and analyze primary research literature.
  - Ability to formulate and pursue an increasingly independent research project during the two years of the program. Research projects are usually carried out in small groups of students and postdocs.
SOCIAL JUSTICE:

- Social justice is not a component of the Biochemistry graduate curricula

OUTCOMES for BS/MS or MS students:

- Upon graduation, biochemistry majors electing the BS-MS option will be well-placed for: Graduate and postdoctoral study in preparation for careers in biomedical research. Employment in pharmaceutical and biotech companies. Careers in other biologically related areas, such as patent law, public health policy, etc.
- Students who entered the MS program will be prepared for careers in biotech and pharma, and some may decide to go on to PhD programs.

SOURCES: Bulletin; Website: http://www.bio.brandeis.edu