

PROFESSIONAL STUDIES MOLECULAR BIOLOGY (PSMB)

Explanation of Course Numbers

- Courses in the 1000s are primarily introductory undergraduate courses
- Those in the 2000s to 4000s are upper-level undergraduate courses that can also be taken for graduate credit with permission and additional work assigned
- Those in the 6000s and 8000s are for master's, doctoral, and professional-level students
- The 6000s are open to advanced undergraduate students with approval of the instructor and the dean or advising office

PSMB 4152. Entrepreneurship and Technology Venture Creation. 4 Credits.

PSMB 5099. Variable Topics. 1-99 Credits.

PSMB 6101. Introduction to Bioinformatics. 3 Credits.

The basic principles of bioinformatics, including genome sequencing, models, and evolution; computational approaches for analyzing biological data. Prerequisites: BISC 1115 and 1125. Recommended background: 4 credits of general biology.

PSMB 6102. Scripting. 3 Credits.

Introduction to basic concepts of scripting in bioinformatics, such as alignments, searches, and data manipulation for biological data. Recommended background: .

PSMB 6103. Genomics. 3 Credits.

Introduction to genes and genomes. Computational and statistical approaches for analyzing genomic and metagenomic data, including genome sequencing and annotation; gene expression; transcriptome, proteomics, and functional genomics; and basic concepts in genetic variation and single nucleotide polymorphisms.

PSMB 6104. Research Orientation. 1-2 Credits.

Introduction to basic approaches to research and professional conduct as a graduate student; curriculum vitae development; scientific writing; human subjects training; biomedical lab safety training; introduction to library resources and literature searches; introduction to writing scientific papers, abstracts, grant applications; and presenting scientific research.

PSMB 6105. Seminar in Computational Biology. 1-2 Credits.

Practical experience in searching current literature, reviewing topics, and interacting in a scientific forum with other students, postdoctoral scholars, visiting faculty, and faculty.

PSMB 6251. A Primer on Computations. 1 Credit.

PSMB 6252. Biomolecular Modeling. 3 Credits.

Principles and practice of molecular simulation; principles of structural biology; principal experimental and computational techniques used to investigate the structure, dynamics, and function of biological systems; practical skills needed to perform and interpret molecular dynamics simulations of biological macromolecules.

PSMB 6253. Principles of Biomedical Instrumentation. 3 Credits.

PSMB 6261. Introduction to Quantitative Biotechnology. 3 Credits.

The study of biology from a physics perspective; quantitative biology; modeling and predicting an organism's reaction to the environment to enable new technologies for disease detection, prevention, and cure; application of mathematical and physical models to the understanding of cellular biology.

PSMB 6262. Bionanotechnology. 3 Credits.

Application of ideas from nanotechnology to solving biological and chemical problems and refining new methods and tools for health and medicine; overlapping, multidisciplinary activities at the intersection of photonics, chemistry, biology, biophysics, nanomedicine, and engineering. Laboratory experiments apply the fundamentals of nanotechnology to DNA and protein sensing. Laboratory fee.

PSMB 6263. Management of Biotechnology Innovation. 3 Credits.

New scientific and technical products, processes, and services related to biotechnology; scientific discovery, emerging technologies, and birth of the biotechnology industry; management concepts and practices to enhance corporate innovation; corporate venture divisions and new management approaches.

PSMB 6264. Entrepreneurship and Technology Venture Creation. 3 Credits.

The process of innovation-entrepreneurship used to launch and build new ventures, with emphasis on technology ventures; organizing for innovation, raising venture capital, wealth creation, managing the small technology-based venture, marketing information technology products and services.

PSMB 6265. Commercialization of Bioscience and Biotechnology. 2 Credits.

PSMB 6266. Capstone Project. 3 Credits.

Issues and standards for ethical conduct of research; career paths in biotechnology; career development tools; scientific written and oral communication, including developing proposals for research funding. Students are required to visit GW's Center for Career Services and to attend select seminars and colloquia.