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.

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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, nano-medicine, 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.