

Shady Grove Biological Sciences
Physiology and Neurobiology (0404E) Sample 2-year plan
(for students under Gen Ed)

First Semester		Second Semester	
Fall	Credits	Spring	Credits
BSCI300	1	Adv. Prog. Lecture	3
BSCI330	4	Adv. Prog. Lecture or Lab	3
BCHM463	3	PHYS332	4
PHYS331	4	Elective or ENGL395	3
Elective or ENGL395	3	Elective ¹	3
Total	15cr.	Total	16 cr.

Third Semester		Fourth Semester	
Fall	Credits	Spring	Credits
BSCI450	3	BSCI353	3
Adv. Prog. Lecture	3	Adv. Prog. Lecture or Lab	2-3
Electives ^{1, 2}	9	Enrichment	3
Total	15 cr.	Electives ^{1, 2}	6
		Total	14-15cr.

1 Elective options may include independent study/research seminars and/or off-campus internships.

2 Elective options may include teaching assistantships for BSCI330, BCHM463, PHYS331/2 or an Adv Prog. Lecture or Lab course.

NOTE: All students must complete an Oral Communication (OC) course as part of the Gen Ed requirements. In the above plan I-Series (IS), Understanding Plural Societies (UP) and Cultural Competence (CC) courses double count with Gen Ed Distributive Studies

updated 5/25/2018

SHADY GROVE BIOLOGICAL SCIENCES (PHNB) PROGRAM COURSE INFORMATION

PHNB Required (Basic, Supporting, Advanced)

PHNB Area/Enrichment

General Elective or General Education

COURSE	DESCRIPTION	CREDITS
BCHM463	A one-semester introduction to general biochemistry. A study of protein structure, enzyme catalysis, metabolism, and metabolic regulation with respect to their relationship to physiology.	3
BIOM301	Biometrics Descriptive statistics, introduction to probability, sampling, confidence interval estimation, hypothesis testing, simple regression and correlation. Emphasis on simple applications of statistical techniques and interpretation of statistical results.	3
BSCI300	Strategies of Success An introductory seminar in which students explore how to successfully bridge the gap between community college and a 4-year university. Study skills, career decision-making, and student development processes will be explored.	1
BSCI329	Undergraduate Teaching Assistantship (Cell Biology, Biochemistry, Physics, Biometrics, Recombinant DNA Technology). *Permission required.	3
BSCI330	Cell Biology and Physiology Biochemical and physiological mechanisms underlying cellular function. Properties of cells which make life possible and mechanisms by which cells provide energy, reproduce, and regulate and integrate with each other and their environment. Includes weekly laboratory instruction	4
BSCI338Z	Off-campus Clinical or Research-Based Internship *Permission required	1-3
BSCI339Y	Invertebrate Physiology Research Seminar Project-based seminar examining the effects of Drosophila mutants associated with human neurodevelopmental disorders on metabolic rate. *Permission required*	3
BSCI339Z	Cell Death & Cancer Research Seminar Project-based biology seminar on Cell Death & Cancer. This course includes the discussion and presentation of research articles, as well as laboratory projects aimed at the characterization and destruction of cancer cells, with a focus on preventing cancer cell evasion of cell death pathways. Priority will be given to students who are either concurrently enrolled in or have completed BSCI343. *Permission required*	3

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BSCI343	Cellular Mechanisms of Aging & Disease Cellular mechanisms underlying aging and a variety of noninfectious diseases and disorders ranging from diabetes and obesity to Alzheimer's and various cancers. In addition to lectures, students will read and discuss relevant primary and secondary literature. Assessments will include student-led discussion of primary literature and group presentations of disease topics.	3
BSCI353	Principles of Neuroscience Principles of nervous system function, ranging from molecular and cellular basis of neuron function through nervous system integration.	3
BSCI358A	Physiology of Pain and Evidence-based CAM A large and growing percentage of Americans suffering from chronic pain use one or more of a wide range of complementary, alternative or unconventional healing therapies, often in addition to seeking advice from physicians, and, increasingly, research is showing efficacy. In this co-taught general elective course, students will explore the basic physiology of pain and chronic pain disorders, how these conditions are treated allopathically, and the various philosophies, practitioners, techniques, and evidence of efficacy of complementary and alternative modalities (CAM) therapeutics currently in use in the United States to treat chronic pain disorders. CAM topics covered will include massage therapy, dietary, mind-body practices, acupuncture, energy therapies, and Ayurvedic practices.	3
BSCI358B	Biotechnological and Biomedical Approaches in Global Health Examines how new biotechnologies and/or biomedical approaches and innovations can be used to address major global health challenges and programs. Students will be introduced to the world's vast diversity of determinants of health and disease, as well as the various contributing factors of global and community health and will apply their understanding of biotechnology/biomedicine to solve real world problems facing public health.	3
BSCI358C	Bioethics of Biotechnology From agricultural technologies such as genetically engineered corn/rice with beta-carotene to optimize vitamin A synthesis, to the use of CRISPR to edit genes of interest in animal and human embryos, biotechnological breakthroughs often raise ethical concerns that need to be examined and addressed. This course provides students with an overview of Biotechnology and a foundation in Bioethics. Through lectures, class discussions/debates, and individual and collaborative work, students will explore how philosophical concepts/theories and social policies can be used to study and reflect on some of the complex enigmas in emerging biotech research.	3
BSCI414	Recombinant DNA Technology Laboratory Hands-on experience in discussing and carrying out recombinant DNA technology. All current molecular biology techniques used for cloning prokaryotic genes, analyzing the gene products, and modifying the genes will be performed. Techniques include isolation of DNA, use of restriction enzymes; cloning procedures, PCR analysis, and Southern hybridizations. Lecture material focuses on interpretation of results generated in the laboratory.	3

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BSCI422	Principles of Immunology The immune system in health and disease. Presentation and analysis of the cellular and molecular processes that comprise the immune system.	3
BSCI437	General Virology Discussion of the physical and chemical nature of viruses, virus cultivation and assay methods, virus replication, viral diseases with emphasis on the oncogenic viruses, viral genetics, and characteristics of the major virus groups.	3
BSCI450	Formerly <i>Mammalian Physiology</i> . A study of the cardiovascular, hematopoietic, gastrointestinal, renal and respiratory systems. Chemical and endocrine regulation of physiological functions in mammals	3
BSCI454	Neurobiology Laboratory Basic neuroanatomical techniques, intracellular and extracellular recordings of electrical potentials from nerve and muscle.	2
ENGL395 (General Education)	Writing for Health Professions Focus on accommodating health-related technical material and empirical studies to lay audiences, and helping writers to achieve stylistic flexibility and correctness.	3
PHYS331	The first part of a two-semester course in general physics specifically oriented towards applications relevant for students in biology and pre-medical programs. The course covers basic mechanics including forces and energy, properties of matter, and thermodynamics done in authentic biological contexts.	4
PHYS332	Physics for Life Sciences II The second part of a two-semester course in general physics specifically oriented towards applications relevant for students in biology and pre-medical programs. The course covers basic statistical physics, electricity and magnetism, and optics done in authentic biological contexts.	4