

Biomedical Sciences PhD Program

First Year Core Curriculum 2008 - 2009

Fall Semester

SGSS 8021 Biochemistry & Gene Regulation (5 Credit Hours)

Prerequisite: Acceptance into the School of Graduate Studies

Description: One semester course includes metabolism; enzyme structure, kinetics and mechanisms; RNA, DNA, and protein biogenesis; DNA repair and recombination; cell cycle control, cancer genetics. Classroom time includes lectures, discussions, and demonstrations using traditional and alternative teaching methods.

Grading System: ABCDF

SGSS 8022 Molecular Cell Biology (5 Credit Hours)

Prerequisite: Acceptance into the School of Graduate Studies

Description: This course focuses on the study of the cell as the fundamental structural and functional unit of which all living organisms are constructed. Cell Biology serves as a bridge between molecular biology, basic biochemistry, physiology, and morphology at the gross anatomical level and is increasingly a principle area of focus for biomedical research. In this course, the properties of cells are analyzed initially by viewing the structural organization, functional interactions, and biogenesis of cellular components with particular emphasis on understanding of processes involved in regulating the specific composition and interactions of cellular organelles. This forms a basis for the subsequent consideration of cell-cell interactions at the cellular and the tissue level. One semester course classroom time includes, lecture discussions, and demonstration using traditional and alternative teaching methods.

Grading System: ABCDF

SGSS 8011 Responsible Conduct of Research (1 Credit Hour)

Prerequisite: Acceptance into the School of Graduate Studies

Description: This course will provide an overview, via lecture and discussion, of critical issues related to the responsible conduct of research. In addition, it will fulfill the requirements established by the Office of Research Integrity and the Public Health Service for ensuring that PHS-supported researchers are provided adequate instruction in conducting responsible research and ensuring integrity of the research record.

Grading System: ABCDF

SGSS 8012 Scientific Communication (1 Credit Hour)

Prerequisite: Acceptance into the School of Graduate Studies

Description: This course focuses on writing and presentation skills needed for a career in biomedical sciences. It provides basic instruction in writing abstracts, curriculum vitae, and grant applications as well as how to organize and give oral scientific presentations. Also covered are basic aspects related to teaching skills needed in the biomedical classroom and laboratory.

Grading System: Satisfactory/Unsatisfactory

SGSS 8040 Introduction to Faculty Research (2 Credit Hours)

Prerequisite: Acceptance into the School of Graduate Studies

Description: An introduction to all of the research topics currently being conducted by biomedical sciences graduate faculty (first half of semester only.)

Grading System: Satisfactory/Unsatisfactory

SGSS 8050 Introduction to Research I (2 Credit Hours)

Prerequisite: Acceptance into the School of Graduate Studies

Description: Individualized instruction in a research or core laboratory. Students should master at least one laboratory technique and become familiar with the various activities of the laboratory (second half of the semester only). Three, 3 week lab; 10-20 hr/week working in the laboratory of a graduate faculty member.

Grading System: Satisfactory/Unsatisfactory

Spring Semester

SGSS 8033 Integrative Systems Biology (6 Credit Hours)

Prerequisite: Acceptance into the School of Graduate Studies

Description: One semester course includes basic anatomy, physiology, and pharmacology of all the organ systems. Special topics also covered include integrated biosystems and feedback, physiological genomics, modern drug discovery, and hot research topics. Classroom time includes lectures, discussions and demonstrations using traditional and alternative teaching methods.

Grading System: ABCDF

SGSS 8060 Introduction to Research II (4 Credit Hours)

Prerequisite: SGS 8050

Description: Individualized instruction in two research or core laboratories. For each laboratory, students should master at least one laboratory technique and become familiar with the various activities of the laboratory. Students will spend half of the semester in each laboratory. Two rotations divided evenly over the term; 10-20 hr/week working in the laboratory of a graduate faculty member.

Grading System: Satisfactory/Unsatisfactory

Selectives: (Student must select one option)

SGSS 8210 Fundamentals of Oncology (4 Credit Hours)

Prerequisite: Satisfactory completion of the first year biomedical sciences core curriculum, or permission of the course director.

Description: As the first semester of a two-semester course sequence, this course covers fundamental aspects of cancer biology with emphasis on the etiology of cancer, natural history of neoplasia, epidemiology of human malignancies, host-tumor relationships, immunobiology and principles of chemotherapy and radiotherapy.

Grading System: ABCDF

SGSS 8080 Neuroscience I (4 Credit Hours)

Prerequisite: SGS 8022 Molecular Cell Biology is required.

Description: Presentations of clinical cases will illustrate the need to understand basic neuroscience principles. These presentations will be followed by a rigorous treatment of the basic neuroscience from the organization of neural systems, to synapses, to molecular mechanisms. Each section will include a discussion of classic papers in the field and relevant current neuroscience research. Neuroscience I will cover the cell and molecular biology of neurons and synapses, motor systems, somatosensory, vision, audition, chemical senses, taste and olfaction, glia and neuroimmunology, regulatory, autonomic and neuroendocrine systems.

Grading System: ABCDF

SGSS 8092 Fundamentals of Genomic Medicine (4 Credit Hours)

Pre-requisite: SGS 8021, SGS 8022, or approval from course director

Description: This course will provide a theoretical framework for understanding the fundamental concepts of mammalian genetics, functional genomics and bioinformatics as well as advanced technical and biological tools used in today's biomedical research environment. The course will provide lectures on a wide range of classical and modern topics such as classical genetics, linkage analysis, genetic mapping, positional cloning, genomics, proteomics and bioinformatics. The focus of the course will be to understand the experimental identification of genes responsible for disease and modern applications of genomics and proteomics to understanding biological processes as well as their impact on modern medicine.

Grading System: ABCDF

SGSS 8065 Critical Analysis of the Mechanisms of Disease (4 Credit Hours)

Pre-requisite: SGS 8021, SGS 8022, or approval from course director

Description: This interdisciplinary course is designed to teach students how to read and analyze literature in the context of introducing students to the pathophysiological basis of disease. Emphasis is placed in three major areas: immunology, microbiology, and organ system pathophysiology. Class time includes a mixture of traditional lectures to cover background material along with a heavy emphasis on student discussion of the primary literature.

Grading System: ABCDF