**Kurse an der Purdue University**

*„HHU students are welcome to take any classes at Purdue which they would find useful and interesting, provided they have appropriate prerequisite coursework.“*

**Link Purdue Vorlesungsverzeichnis:** <https://selfservice.mypurdue.purdue.edu/prod/bwckschd.p_disp_dyn_sched>

**Beispiele / Kursauswahl**

**1) Fall semester**

**BIOL 43600 - Neurobiology**

This course will cover key aspects in molecular, cellular, and developmental neurobiology. Topics include: Cell biology of neurons and glia, electrophysiological properties of neurons, electrical and chemical signaling between neurons, synaptic integration and plasticity, development and regeneration of the nervous system, nervous system diseases. Up-to-date research findings and techniques will be included.

**BIOL 53300 – Medical Microbiology**

Host-parasite relationships. Immunology. Bacteria and viruses associated with infectious diseases.

**BIOL 52900 – Bacterial Physiology**

A detailed consideration of the central metabolic routes, their role in generation of energy and key intermediates, and the conversion of those intermediates to small molecule building blocks. Regulatory mechanisms will be stressed

**BIOL 55900 – Endocrinology**

The study of hormone function. Consideration will be given to the role of hormones in growth, development, metabolism, homeostasis, and reproduction.

**BIOL 44400 – Human Genetics**

An intermediate-level survey course of human genetics with a balanced review of both Mendelian and molecular aspects. Review of current development and application of DNA technology emphasized

**BIOL 43800 – General Microbiology**

An examination of microbial diversity that emphasizes the interrelationship of bacteria and their environments. This includes aspects of cell composition, metabolism, and growth of microorganisms.

**BCHM 46200 – Metabolism**

A lecture course to provide students with a broad and thorough understanding of core metabolic pathways and how they are resulted. Anabolic and catabolic processes of metabolic pathways will be studied at the biochemical, structural, genetic and molecular levels. Students will learn to appreciate how the various metabolic pathways are integrated and how the fundamental metabolic pathways relate to medicine, agriculture and human disease.

**BCHM 46300 – Macromolecular Machines**

A tour of the cell from the perspective of the macromolecules. This course examines how the three-dimensional structures of biological molecules confer cellular function

**BCHM 56100 – General Biochemistry I**

This course provides upper-division undergraduate and graduate students with basic understanding of biochemical and structural properties of amino acids, nucleic acids, lipids, and carbohydrates. This course allows students to connect the relationship between structure and function of biomolecules. In addition, students learn to understand enzyme properties, enzyme mechanism of action, and enzyme regulation

**BTNY 52500 Intermediate Plant Pathology**

Examines the biological and pathological characteristics of major causal agents; concepts of epidemiology and disease assessment; physiology, genetics, and molecular biology of host-pathogen interactions; disease management practices; and methods of disease diagnosis.

**BTNY 55800 – Pathogens of Plants**

Plant pathology is the science of plant diseases and of the microorganisms that cause them and of our attempts to manage plant diseases. The ultimate goal of plant pathologists is to reduce the losses caused by diseases, thereby, increasing both the quality and quantity of the world food supply. Plant diseases are caused by the same types of microorganisms that cause disease in animals and humans and, as such, many of the principles that apply to human and animal medicine apply to plant diseases. It is the objective of this course to introduce students to the major types of plant pathogens (plant pathogenic bacteria, viruses, nematodes, and fungi), their basic biology and examples of the types of diseases they cause. It will be expected that students have knowledge in plant pathology

**BIOL 47800 – Introduction to Bioinformatics**

Bioinformatics is broadly defined as the study of molecular biological information, targeting particularly the enormous volume of DNA sequence and functional complexity embedded in entire genomes. Topics will include understanding the evolutionary organization of genes (genomics), the structure and function of gene products (proteomics), and the dynamics of gene expression in biological processes (transcriptomics). Inherently, bioinformatics is interdisciplinary, melding various applications of computational science with biology. This jointly taught course introduces analytical methods from biology, statistics and computer science that are necessary for bioinformatics investigations. The course is intended for junior and senior undergraduates from various science backgrounds. Our objective is to develop the skills of both tool users and tool designers in this important new field of research

**2) Spring semester**

**BIOL 41600 – Viruses and Viral Design**

The objective of this course is to provide students with an introductory understanding of viruses and their impact on human health. The course will be divided into two sections. During the first section, we will discuss the cellular and organismal events that occur following virus infection, including viral entry, replication, modulation of cell biology by viral proteins, the host immune response to infection, evasion of the immune response by viruses, and resulting virus-induced disease. The emphasis of this first section will be on the general strategies used by viruses to establish and maintain infection in a population. In the second section, we will discuss in relative detail our current understanding of select important human viruses including influenza, HIV, smallpox, the herpesviruses, and tumor-causing viruses. The objective of this section will be to understand how the unique aspects of each virus's biology affect the outcome of infection with these pathogens. In addition to virus-associated diseases, we will discuss potential ways that viruses may provide symbiotic benefits to their hosts and thereby shape the course of human evolution. Throughout the course, we will emphasize societal and political aspects of virology and virus-derived technologies, including vaccine development, the use of viruses as gene therapy vectors, and the threat of viral bioterror of bio-error

**BIOL 51600 – Molecular Biology of Cancer**

A detailed course examining the molecular mechanisms controlling the growth of animal cells. Emphasis will be placed on current experimental approaches to defining the molecular basis of growth regulation in developing systems and the uncontrolled proliferation of cells in metabolic disorders, such as cancer.

**BIOL 53700 – Immunobiology**

Readings and discussion in the structural, cellular, and genetic basis of the immune response. Biology 420 recommended as a pre-requisite.

BIOL 53800 – Molecular, Cellular, and Developmental Neurobiology

**BIOL 48100 Eucaryotic Genetics**

This course presents the fundamental concepts of classical and modern molecular genetics in eukaryotic systems, using examples from the model genetic organisms, yeast, Drosophila, Caenorhabditis, Arabidopsis, maize, mice and humans. These concepts are applied to solving problems of genetic analysis. Recent advances in developmental, cancer, and behavioral genetics and genomics, and applications of genetic technology, are used to demonstrate the impact that modern genetics makes at the cutting edge of biological research.

**BIOL 55001 – Eukaryotic Molecular Biology**

This is a general survey course intended for advanced undergrads and beginning grad students. The course will draw upon examples from the plant, animal, and fungal kingdoms, and will familiarize students with the basic principles of molecular biology analyses as they apply to eukaryotic organisms. By the end of the course students should have knowledge of these molecular processes and should be able to design and analyze experiments dealing with these topics. This is not a first course in molecular biology

**BCHM 36100 – Molecules**

A lecture course that relates biochemistry to organic chemistry. Chemical principles relevant to the assembly and function of macromolecules, the logic of biological free energy conversion, and enzyme catalysis are emphasized, all of which provide a foundation for the study of metabolism.

**BCHM 53600 “Biological & Structural Basis for Drug Design & Action**

This course is aimed at expanding students' fundamental interests in biology, chemistry and biochemistry to how drugs work. The course will provide an overview of the modern day drug discovery pipeline and an in-depth look at the basic biology, structure, and mechanisms-of-action behind marketed therapeutics. The course will start with a historical account of the discovery of natural product drugs such as aspirin and penicillin and will then venture into the modern day era of drug discovery including structure-based drug design. We will explore different classes of antibiotics, antiviral, and anti-cancer drugs and their targets including small molecule drugs and modern biologics-based drugs

**BCHM 49500 “Medical Topics in Biochemistry”**