

# BIOCHEMISTRY (BCHM)

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## **BCHM 802 - Endocrinology**

**Credits: 4**

Structure and function of vertebrate endocrine systems through the lens of physiology, biochemistry, and cell and molecular biology, with special reference to mammals. Current investigations of the body's major endocrine glands, such as the brain, thyroid, pancreas, adrenals and gonads, as regulators and integrators of biological systems. A previous cell biology course is recommended. Prereq: one semester of biochemistry.

## **BCHM 850 - Physical Biochemistry**

**Credits: 3**

Structure, interactions, and physical-chemical properties of biomolecules. Thermodynamic, kinetic, and spectroscopic methods for the study of proteins and nucleic acids. Prereq: 2 semesters organic chemistry, 1 semester of calculus; or permission.

## **BCHM 851 - Principles of Biochemistry I**

**Credits: 4**

In-depth survey of biochemistry: macromolecule structure; structure and function of proteins, nucleic acids, carbohydrates, and lipids; introduction to metabolic pathways. Prereq: One semester of organic chemistry; or permission.

## **BCHM 852 - Principles of Biochemistry II**

**Credits: 4**

In-depth survey of biochemistry: metabolism of amino acids, nucleotides, carbohydrates and lipids; macromolecules synthesis and regulation; molecular biology of the eukaryotic cell. Prereq: BCHM 851 or permission.

## **BCHM 854 - Molecular Biology Research Methods**

**Credits: 5**

Theory and application of current technologies to manipulate DNA. Hands-on experience that includes DNA isolation and quantitation methods, cloning, PCR, DNA sequencing, and analysis of gene products. Prereq: introductory genetics. Special fee. Lab.

## **BCHM 855 - Laboratory in Biochemistry and Molecular Biology**

**Credits: 5**

Application of modern techniques to the characterization and purification of bio-molecules, with an emphasis on proteins and nucleic acids. Analysis of enzyme kinetics and basic techniques used in molecular biology. Prereq: one semester of biochemistry or permission. Special fee.

## **BCHM 860 - Pharmacology**

**Credits: 4**

Introduction to the basic principles and fundamental concepts of pharmacology, with a focus on molecular mechanisms and pathological basis of therapeutics and the curative effects. Topics include: foundations of pharmacology including pharmacodynamics and pharmacogenomics; drugs affecting the nervous system (neuropharmacology); drugs affecting other systems; chemotherapeutic drugs. Prereq: one semester of biochemistry or permission.

## **BCHM 863 - Biochemistry of Cancer**

**Credits: 4**

Evaluation of the hallmarks of cancer, including molecular mechanisms of carcinogenesis, roles of oncogenes and dysregulated cell development, function and metabolism, tumor immunology, and the biological basis of cancer therapy. Prereq: one semester biochemistry or permission.

## **BCHM 883 - Proteomics for Biological Discoveries**

**Credits: 4**

Large-scale, high-throughput study of proteins; characterization of entire set of proteins in a biological sample (proteome); quantification of changes in protein composition, interactions and post-translational modifications; major technology platforms; pharmaceutical and biomedical applications. Develop skills in processing samples from research projects; analysis of mass spectrometric data. Prereq: one semester of biochemistry or permission.

## **BCHM 894 - Protein Structure and Function**

**Credits: 4**

Analysis of how the three-dimensional architecture of soluble and membrane proteins contributes to their biochemical function; methods for determining the structure of proteins; protein folding; protein targeting; and mechanisms of enzyme catalysis. Computer resources will be used for protein modeling and structural prediction. Prereq: one semester of biochemistry.

## **BCHM 895 - Special Topics**

**Credits: 1-4**

Special topics course.

## **BCHM 899 - Master's Thesis**

**Credits: 1-10**

May be repeated to a maximum of 10 credits. Cr/F.

## **BCHM 999 - Doctoral Research**

**Credits: 0**

Cr/F.