

# IBS - INTERDISCIPLINARY BIOMEDICAL SCIENCES

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## **IBS 7015 Interdisciplinary Cell and Molecular Biology Cr. 6**

The fundamental biochemistry, molecular biology, and function of eukaryotic cells. Includes study of the structure and purpose of the basic components of eukaryotic cells; how eukaryotic cells obtain and utilize energy, process information, and replicate or self-destruct; and examples of how specific cell types contribute to multicellular biological processes and systems in normal and disease states. Offered Fall.

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in a Doctor of Philosophy degree; enrollment limited to students in the School of Medicine.

## **IBS 7030 Functional Genomics and Systems Biology Cr. 2**

Exploration of several new technologies for determining gene function on a genome-wide scale and for integrating information into a systems-level view of biological processes. Offered Winter.

**Prerequisite:** IBS 7015 with a minimum grade of C or MGG 7010 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in a Doctor of Philosophy degree; enrollment limited to students in the School of Medicine.

**Equivalent:** MGG 7030

## **IBS 7050 Molecular Neuropsychopharmacology Cr. 2**

Sensory, motor, and integration of nervous systems, including anatomic and cellular organization, systemic and cellular-molecular functions, and diseases. Offered Winter.

**Prerequisites:** IBS 7015 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in a Doctor of Philosophy degree; enrollment limited to students in the School of Medicine.

## **IBS 7090 Fundamentals of Immunology Cr. 2**

Cellular-molecular and systemic functions, and diseases of the immune system. Offered Winter.

**Prerequisites:** IBS 7015 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate level students; enrollment limited to students in a Doctor of Philosophy degree; enrollment limited to students in the School of Medicine.

**Equivalent:** IM 7010

## **IBS 7100 Biomedical Neuropharmacology Cr. 2**

General principles, including cellular and molecular basis of drug action with special emphasis on neuronal systems. Offered Winter.

**Prerequisites:** IBS 7015 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate or Medical level students; enrollment limited to students in the School of Medicine.

## **IBS 7130 Systems Neuroscience: Structure and Function of the Nervous System Cr. 2**

Basic principles of neural science through examination of structure and function of the major physiological systems within the brain and spinal cord. Offered Winter.

**Prerequisites:** IBS 7015 with a minimum grade of C

**Restriction(s):** Enrollment is limited to Graduate or Medical level students; enrollment limited to students in the School of Medicine.

## **IBS 7140 Foundations of Machine Learning and Artificial Intelligence with Python, Scikit-Learn, and PyTorch Cr. 3**

Introduction to basic concepts of linear algebra and their application to data analysis. MATLAB and PYTHON programs are introduced and employed as tools for practical implementation of computational methods. Offered Fall, Winter.

**Restriction(s):** Enrollment is limited to Graduate level students.

**Equivalent:** BMB 7140

## **IBS 7320 Protein Structure and Function Cr. 3**

Structure, function, and design of proteins: architecture, function, regulation, assembly and evolution of proteins and protein complexes; theory and techniques of kinetic analysis; newer techniques of protein design and engineering. Offered Winter.

**Restriction(s):** Enrollment is limited to Graduate level students.

**Equivalent:** BMB 7320

## **IBS 7330 Advanced Molecular Biology Cr. 2**

Modern topics in biochemistry, including nucleic acid dynamics, genomic structure, DNA replication and repair, transcription, RNA processing, translation and protein synthesis. Offered Winter.

**Restriction(s):** Enrollment is limited to Graduate level students.

## **IBS 7690 Principles and Techniques of Reproductive Biology Cr. 3**

Principles and techniques in reproduction including endocrinology, gametogenesis, fertilization, implantation, embryogenesis, stem cell determination, pregnancy and parturition. Offered Fall.

**Restriction(s):** Enrollment is limited to Graduate level students.

**Equivalent:** PSL 7690