

# BIOC 532: Biological Importance of Modifications in DNA and Chromatin

Chromatin modifications play important roles in many cellular processes, including the regulation of gene expression, DNA repair, and the heterochromatin formation. This course will explore the various biological roles chromatin modifications play in eukaryotic cells. Topics that will be discussed include: histone and DNA modifications and the enzymes responsible for these modifications; mechanisms of chromatin remodeling and transcription regulation; the role of non-coding RNAs in chromatin structure and gene regulation; higher-order chromatin organization and the use of various chromosome capture conformation methods; and, chromatin structure and DNA damage repair. In addition, this course will introduce students to the genome-wide analysis of ChIP-seq and RNA-seq data using a variety of softwares, including publicly accessible web servers such as Galaxy and UCSC genome browser.

## Learning Objectives

- Understand basic concepts behind epigenetics
- Understand why epigenetics is important in understanding human diseases
- Explain how epigenetic mechanisms work

Sample syllabus is subject to change.

**Credits:** 2

**Class Type:** Graduate Course

**Prerequisites:**

General understanding of basic concepts in genetics and biochemistry.

**Program:** Biochemistry, Chemistry, Pharmacology, and Toxicology