

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY  
BIO 256 - GENERAL GENETICS (4 CR.)**

**Course Description**

Explores the principles of genetics ranging from classical Mendelian inheritance to the most recent advances in the biochemical nature and function of the gene. Includes experimental design and statistical analysis. Lecture 3 hours. Recitation and laboratory 6 hours. Total 6 hours per week.

**General Course Purpose**

The purpose of this course is to provide the student with the opportunity to discover the fundamental principles governing the mechanisms of inheritance on the biochemical level, the organismic level, and the population level; and to apply these principles in problem solving situations.

The course is designed primarily for biology majors. The course serves as a second year laboratory scene elective.

**Course Prerequisites/Co-requisites**

Prerequisites are any two of the following courses: BIO 101, 102, 110, 120, 141, 142 or division approval.

**Course Objectives**

Upon completion of this course, the student should be able to:

- read and interpret written material of a genetic nature
- diagram and explain the fundamentals of the chemical nature of the gene and its basic action
- diagram basic Mendelian crosses and predict the types and frequencies of the expected first and second generation progeny
- discuss the factors which affect inheritance patterns, such as sex, recombination, chromosome aberrations and point mutations
- interpret research data in the areas of gene action and regulation
- calculate gene frequencies in populations and analyze factors that affect these frequencies

**Major Topics to be Included**

- Meiosis
- Mendelian genetics
- Sex determination and sex linkage
- Probability and Chi Square analysis
- Genetic crossing over, recombination and gene mapping
- Biochemical nature of the gene
- Bacterial and viral genetics and genetic engineering
- Protein synthesis and the genetic code
- Gene regulation
- Quantitative inheritance
- Gene and chromosomal mutations
- Gene frequencies in populations and the processes of evolutionary change

**Optional Topics**

- Inbreeding, coadaptation, and geographic differentiation
- Specialization and macro evolution
- Genetics and society