

**Course Objectives/Course Outline**  
**Spokane Community College**

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**Course Title: Genetics**  
**Prefix and Course Number: BIOL 244**

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**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- describe Mendelian inheritance plus extensions
- perform calculations to predict expected genotypic and phenotypic ratios of offspring
- interpret family pedigrees
- explain gene linkage and genetic recombination
- explain the structure and mapping of bacterial and viral genomes
- describe the process of gene expression (and mechanisms of regulation)
- explain and discuss the applications of molecular techniques and evaluate related ethical issues
- describe the impact of genomics on the science of genetics
- apply the Hardy-Weinberg law to predict expected allele and genotype frequencies in a population at equilibrium
- describe mechanisms for speciation

**Course Outline:**

- I. Chromosome Theory of Inheritance
  - A. Mitosis and Meiosis
  - B. Mendelian Genetics
  - C. Pedigrees
  - D. Extensions of Mendelian Genetics
  - E. Sex Chromosomes and Sex Linkage
- II. Chromosome Mutation
  - A. The Structure and Function of Eukaryotic Chromosomes
  - B. Variation in Chromosome Number
  - C. Variation in Chromosome Arrangement
- III. DNA Structure and Gene Expression
  - A. DNA Structure and Analysis
  - B. Mapping
  - C. Gene Linkage
  - D. Recombination
  - E. The Genetic Code and Transcription
  - F. Translation and Proteins
  - G. Gene Mutation and DNA Repair
  - H. Regulation of Gene Expression in Prokaryotes
- IV. Applications and Molecular Techniques
  - A. Recombinant DNA Technology and Cloning
  - B. Ethical Concerns
    - A. DNA Sequencing
    - B. Genomics
    - C. Bioinformatics

Print Date:

- V. D. Proteomics
- Quantitative Genetics
  - A. Population Genetics
  - B. Evolutionary Genetics