

**Northwest Arkansas Community College**  
(Science and Mathematics Division)

**Discipline Code**

BIOL

**Course Number**

2324

**Course Title**

Genetics

**Catalog Description**

This course will study the basic concepts in classical and molecular genetics. Topics include Mendelian inheritance and its variations, linkage, chromosomes, gene mapping, bacterial and viral genetics, extranuclear inheritance, DNA structure and replication, mutation, DNA repair, recombinant DNA technology, genetic code, and gene expression/regulation. Laboratory exercises illustrate principles of inheritance in various biological systems and provide hands-on experience with several recombinant DNA techniques. Three hours lecture/discussion and three hours laboratory per week.

**Prerequisites**

At least one semester of college biology and one semester of college chemistry.

**Credit Hours**

4 credit hours

**Contact hours**

45 lecture contact hours; 45 lab contact hours

**Load hours**

5 load hours

**Semesters Offered**

Fall, on demand

**ACTS Equivalent**

None

**Grade Mode**

A-F

**Learning Outcomes**

Students completing this course will:

- Develop insight into the transmission of traits on the molecular, cellular, and organismal level.
- Develop hypotheses and evaluate them based on relevant facts of heredity and environment.
- Explain how a geneticist determines the number of genes involved with a specific trait based on a

population data set.

- Analyze genetic data to solve simple and complex genetic problems based on relevant facts in a real-world situation.
- Describe at the biochemical level expression from gene to phenotype.
- Describe relationships between mutations and new alleles.
- Explain genetic terminology and genetic probabilities.
- Demonstrate major recombinant DNA techniques used in genetics and molecular biology.

## **General Education Outcomes Supported**

Students develop higher order thinking skills.

## **Standard Practices**

### **Topics list**

- Mitosis and Meiosis
- Mendelian genetics
- Sex determination and Sex Chromosomes
- Genetic mutations
- Extranuclear inheritance
- DNA structure, replication, and variation
- Gene expression, regulation, and development
- Genomics, rDNA tech,
- Proteomics, and Bioinformatics
- Population genetics

### **Learning activities**

- Courses must, at a minimum, cover the core learning outcomes for each topic.
- Laboratory exercises should include Mendelian and non-Mendelian genetics, genetic crosses, statistical analysis, population genetics, bioinformatics, and molecular techniques.
- Course includes a Course-based Undergraduate Research Experience (CURE)

### **Assessments**

- Required forms of assessment include written examinations, formal laboratory journal, and demonstration of understanding of the principles presented in lecture. Also, students will be required to demonstrate proficiency in applying core laboratory skills and practices used in the study of genetics.

### **Grading guidelines**

- A minimum of 70% of the grade must be proctored, supervised, or otherwise verified.
- Approximately 25% of the grade must come from lab work since the lab and lecture credits for this course are combined.

**Revision Date** Nov 9, 2021