

# North Hennepin Community College

## BIOL 2360: Genetics

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 3

OJT Hours/Week: \*.\*

Prerequisites:

This course requires all three of these prerequisite categories

1. One of these two

BIOL 1001 - Biology I (Minimum grade: 1.67 GPA Equivalent)

BIOL 1101 - Principles of Biology I (Minimum grade: 1.67 GPA Equivalent)

And

2. BIOL 1102 - Principles of Biology II (Minimum grade: 1.67 GPA Equivalent)

And

3. Any one of these six

MATH 1150 - College Algebra (Minimum grade: 1.67 GPA Equivalent)

MATH 1170 - Pre-Calculus (Minimum grade: 1.67 GPA Equivalent)

MATH 1180 - College Algebra and Pre-Calculus (Minimum grade: 1.67 GPA Equivalent)

MATH 1200 - Calculus Survey (Minimum grade: 1.67 GPA Equivalent)

MATH 1221 - Calculus I (Minimum grade: 1.67 GPA Equivalent)

A score of 79 on test Accuplacer College Level Math

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

We will examine the organization, storage, maintenance, transfer, and expression of genetic information. Molecular data and Mendelian principles will be applied to understand genetics at the molecular, cellular, organismal, and population levels. Skills of professional biologists will be practiced, such as reading primary literature, designing/carrying out experiments, and evaluating qualitative and quantitative data. Prerequisite: BIOL 1101 or BIOL 1001, and BIOL 1102, and MATH 1150, with a C or better in each. Co-enrollment in BIOL 1102 can be considered with instructor permission. 3 hours lecture, 3 hours lab

**B. COURSE EFFECTIVE DATES:** 08/22/2016 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Genes, alleles, and the chromosome theory of inheritance.
  - Probability of producing particular genotypes and phenotypes
  - Analysis of pedigrees and outcomes of crosses to identify patterns of inheritance
  - Structures and relationships of DNA, RNA, and proteins
  - Interactions of genotype, epigenetic information, and environment on phenotypic expression
  - Genome organization, gene and chromosome structure in prokaryotes and eukaryotes
  - Use of model organisms and bioinformatics
  - Mutation, mobile elements and other mechanisms of change, and their effect on populations and individuals

#### **D. LEARNING OUTCOMES (General)**

1. Explain genetics concepts at the molecular, cellular, organismal, and population levels. (Goal 3a, ELO 1)
2. Evaluate data to predict and calculate patterns of inheritance. (Goal 3bd, ELO 1, 2, 4)
3. Apply relevant statistical tests to genetic data analysis. (Goal 3bcd, ELO 1, 2, 4)
4. Apply relevant statistical tests to genetic data analysis. (Goal 3bcd, ELO 1, 2, 4)
5. Explain the relevance and relationships between prokaryote and eukaryote model organisms and other life, including humans. (Goal 3ad, ELO 1, 2)
6. Read and assess primary scientific literature. (Goal 3acd, ELO 1, 2, 4)
7. Use bioinformatics to interpret genomic and genetic data. (Goal 3acd, ELO 1, 2, 4)
8. Identify and consider ethical issues presented by available genetic technology and information. (Goal 3d, ELO 3)
9. Communicate in standard scientific formats, such as lab notebooks, formal lab reports, journal clubs, research posters and/or presentations. (Goal 3c, ELO.1, 2, 4)

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted