

**JAMESTOWN COMMUNITY COLLEGE**  
**State University of New York**

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**INSTITUTIONAL COURSE SYLLABUS**

**Course Title:** Genetics

**Course Abbreviation and Number:** BIO 2560

**Credit Hours:** 4

**Course Type:** Lecture/Lab

**Course Description:** Students will identify the fundamental concepts of heredity, including Mendelian principles and extensions, structure and replication of chromosomes, gene and chromosomal mutations, gene linkage and chromosome mapping, transcription and translation, regulation of gene expression, mechanisms of mutation, recombination and repair, population genetics, molecular evolution, cloning and recombinant DNA technology, and other contemporary topics.

Prerequisite: ENG 1510 and BIO 1570; Prerequisite / Corequisite: CHE 1550 or higher.

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**General Education Requirements Met**

**SUNY**

Natural Sciences

**JCC**

Applied Learning

Scientific Reasoning

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**Student Learning Outcomes:**

Students who demonstrate understanding can:

1. Demonstrate an understanding of the methods scientists use to explore natural phenomena, including observation, hypotheses development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling. [SUNY Gen Ed – Natural Sciences]
  2. Application of scientific data, concepts, and models in one of the natural sciences. [SUNY Gen Ed – Natural Sciences]
  3. Effectively apply knowledge and skills to a real-world experience, creative project, or independent intellectual investigation. [JCC Gen Ed – Applied Learning]
  4. Thoughtfully reflect on connections between concepts studies in the classroom & insights gained from an applied learning experience/project. [JCC Gen Ed – Applied Learning]
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**Topics Covered:**

- DNA, RNA and protein biochemistry
  - Transcription and associated regulatory mechanisms
  - Translation and associated regulatory mechanisms
  - Replication, associated regulatory mechanism and mutagenesis
  - Mitosis and meiosis
  - Epigenetics and control of gene expression
  - Basic Mendelian genetics- monohybrid and dihybrid crosses
  - Sex determination and sex-linked traits
  - Pedigree analysis
  - Linkage recombination and mapping
  - Chromosomal abnormalities and variations
  - Proteomics and genomics
  - Developmental genetics
  - Molecular genetics
  - Population genetics
  - The structural differences between eukaryotic and prokaryotic genomes
  - Modern techniques in molecular genetics including DNA and RNA isolation, cloning technologies, Polymerase Chain Reaction, Reverse Transcription-Polymerase Chain Reaction, and other techniques for genomics and proteomics like DNA sequencing and microarray, etc
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**Information for Students**

- Expectations of Students
  - [Civility Statement](#)
  - [Student Responsibility Statement](#)
  - [Academic Integrity Statement](#)
- [Accessibility Services](#)  
Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
- [Get Help: JCC & Community Resources](#)

- [Emergency Closing Procedures](#)
- Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0
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- Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.

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**Effective Date:** Fall 2023