# BIO-2070: TECHNIQUES IN MOLECULAR GENETICS

## Cuyahoga Community College

### Viewing: BIO-2070 : Techniques in Molecular Genetics

**Board of Trustees:**
1997-10-23

**Academic Term:**
Fall 2019

**Subject Code**
BIO - Biology

**Course Number:**
2070

**Title:**
Techniques in Molecular Genetics

**Catalog Description:**
Advanced study of structure and function of DNA with emphasis on laboratory
techniques used in molecular biology. Laboratory practices and applications
of sterile techniques, gel electrophoresis, DNA isolation, RFLP analysis, plasmids, and recombinant DNA. Protein structure and methods of protein
purification explored.

**Credit Hour(s):**
3

**Lecture Hour(s):**
1

**Lab Hour(s):**
4

**Other Hour(s):**
0

### Requisites

**Prerequisite and Corequisite**
BIO-1040 The Cell and DNA, or BIO-2341 Anatomy and Physiology II, or BIO-1500 Principles of Biology I.

### Outcomes

**Course Outcome(s):**
N/A

**Objective(s):**
1. Describe in detail the structure of DNA.
2. Recognize the importance of bacterial DNA in molecular genetics.
3. State the applications of various DNA technologies in agriculture, medicine, industry, and forensics.
4. Describe the relationship between DNA and protein synthesis.
5. Recognize the importance of protein function and perform various methods of protein separation and purification.
6. Identify the bioethical consequences of DNA technologies.
7. Locate and use current genetic information such as journal articles, the Internet, and technical newsletters.
8. Demonstrate sterile technique.
9. Use laboratory methods to isolate DNA.
10. Apply gel electrophoresis technique to RFLP analysis.
11. Use plasmids to obtain recombinant DNA.
12. Analyze the components of a karyotype.
13. Select and perform a laboratory investigation.

**Methods of Evaluation:**

1. Examinations
2. Written review of current genetic information
3. Quizzes
4. Laboratory reports
5. Presentation of laboratory investigation

**Course Content Outline:**

1. Structure and function of DNA
2. Bacterial DNA
   a. E. coli
   b. Plasmid
   c. Recombinant DNA
3. DNA technologies
   a. Sterile technique
   b. DNA isolation
   c. DNA fingerprinting
   d. Recombinant DNA
   e. Karyotyping
4. Applications of DNA technologies
   a. Agriculture
   b. Medicine
   c. Industry
   d. Forensics
5. Proteins
   a. Protein synthesis
   b. Protein function
   c. Methods of purification
   d. Methods of analysis
6. Bioethics
7. Careers in molecular genetics

## Resources

Kreuzer, Helen. *Recombinant DNA and Biotechnology.* American Society for Microbiology, 1996.

Lewis, Ricki. *Human Genetics: Concepts and Applications.* William C. Brown, 1994.

Maniatis, Tom, et al. *Molecular Cloning: A Laboratory Manual.* Cold Spring Harbor Laboratory, 1989.

"BioScience"

"Genetic Engineering News"

"Nature"

"Science"

"Scientific American"

"The Scientist"

**Resources Other**

1. Internet.
2. Technical Newsletters (Edvotech).

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