

SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Sciences
Revision Date: 07-01-19

I. CATALOG DESCRIPTION

Course Number: BIOT 2446
Course Title: Molecular Biology Techniques
Prerequisite(s): BIOT 2400
Catalog Description: Theory and applications of cell culture techniques. Laboratory emphasis on the principles and practices of initiation, cultivation, maintenance, preservation of cell lines and applications. A study of cell culture techniques, the laboratory emphasizes the principles and practices of initiation, cultivation, maintenance, and the preservation of cells lines including applications such as transfection and project management. Basic immunology including ELISAs and Western Blots are also taught.

Credit Hours: 4.0
Class Hours: 20
Lab Hours: 50
Total Contact Hours: 70

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce student to theory and laboratory techniques in molecular biology.
- B. Challenge students to apply critical thinking skills to their readings, class activities, laboratory exercises, and classroom discussions about current topics in biotechnology.
- C. Emphasis will be placed on topics such as DNA replication, transcription, gene expression and regulation, recombinant DNA and RNA techniques, DNA sequencing, and bioinformatics tools.
- D. Focus on documentation and quality in the bioscience workplace.
- E. Prepare the student for more advanced Biotechnology courses.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Understand and use terminology of the field
 - 2. Utilize the internet to research current regulations
 - 3. Participate in class discussions
 - 4. Communicate results
 - 5. Coordinate with a team
 - 6. Produce documentation
- B. General Education Learning Outcomes
 - 1. GELO #3: Critical Thinking & Problem Solving
 - Outcome: Collect, identify, interpret and analyze data.
 - Outcome: Synthesize information to arrive at reasoned solutions to problems.
 - Outcome: Evaluate ideas presented in writing, media, speech, or artistic presentations.
 - Outcome: Acquire and integrate knowledge and construct relationships across disciplines.
 - 2. GELO #5: Analytical, Quantitative, and Scientific Reasoning
 - Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.
 - Outcome: Understand and create logical arguments supported by quantitative and scientific evidence and communicate those arguments in a variety of formats.

Outcome: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.

Outcome: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

- A. Quality in the Molecular Biology Lab
- B. DNA, RNA, and Protein
- C. Nucleic Acid Isolation and Analysis
- D. PCR
- E. Primer Design
- F. Cloning Procedures and Recombinant DNA Technology
- G. DNA Sequencing
- H. Real Time PCR
- I. Molecular Diagnostics
- J. Bioinformatics
- K. RNA technology

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s):
 - 1. Wink, *An Introduction to Molecular Biotechnology - Fundamentals, Methods and Applications*. 2nd edition. ISBN: 978-3-527-32637-2.

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Lecture = Power Point lectures plus occasional short videos.
 - 2. Demonstration
 - 3. Computer based data analysis

VII. METHODS OF EVALUATION

- A. Methods of evaluation typically include a combination of the following:
 - 1. Exams
 - 2. Quizzes
 - 3. Homework from lecture and lab
 - 4. In-class assignments
 - 5. Oral presentation
- B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIRMENTS

- A. Lab Notebook
- B. Fine tip black Sharpie
- C. Scientific Calculator with statistics and linear regression capabilities
- D. Lab Coat (to be left in lab at all times)
- E. Safety glasses