

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

I. CATALOG DESCRIPTION

Course Number: BIOT 2443
Course Title: Manufacturing and Production
Prerequisite(s): BIOT 2400
Catalog Description: This course will provide an understanding of scientific concepts that are important for the manufacturing and production of biotechnology products. This includes the processes used to prepare media, clean and calibrate equipment, maintain and optimize biological cultures in a large-scale production environment. Production methods to recover, purify and formulate biotechnology products from biological cultures will be covered along with newer trends in biomanufacturing such as single-use production technology.
Credit Hours: 3.0
Contact Hours: 45

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce student to theory and concepts of biomanufacturing.
- 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 fermentation, chromatography, single-use technology, bioreactors, and human-machine interfaces (HMI).
- D. Focus on documentation and quality in the bioscience workplace.

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 #1: Oral Communication
Outcome: Develop a central idea for presentations.
 - 2. 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.
 - 3. 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 manufacturing and production
- B. Human-machine interface (HMI)
- C. Fermentation
- D. Bioreactors
- E. Regulated Cleaning and calibrating procedures
- F. Chromatography
- G. Single-use production technology
- H. Equipment Calibration
- I. Media preparation and Components
- J. Quality Control
- K. Product formulation and packaging

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s):
 - 1. No textbook required.

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. Scientific Calculator with statistics and linear regression capabilities