

Montgomery County Community College  
BIT 123  
Techniques and Instrumentation for Biotechnology  
4-2-3

**COURSE DESCRIPTION:**

This course will allow students to gain theoretical and practical, hands-on knowledge of the operation, maintenance and calibration of commonly used and specialized laboratory instrumentation. Laboratory procedures will include solution preparation, aseptic technique, protein separations and assays, electrophoresis and recombinant DNA technology. The students will be introduced to the concept of working with good laboratory practices as they pertain to documentation and record keeping. Discussion and implementation of laboratory safety policies will be key components to the entire course. This course is subject to course fee.

**REQUISITE(S):**

BIT 120 Introduction to Biotechnology,

CHE 131 - Chemistry for Technology I, **or**

CHE 151 - Principles of Chemistry I (For students intending to transfer)

These courses may be taken concurrently **or** may have been taken successfully in a prior semester.

Upon successful completion of this course, the student will be able to:

**LEARNING OUTCOMES**

**LEARNING ACTIVITIES**

<p>4. Develop a written SOP for a laboratory process or instrument.</p>	<p>Lecture Small Group Discussions Laboratory Experiments Reading and Problem-Solving Assignments</p>	<p>Section Examinations Final Comprehensive Examination Lab exercises and reports Written assignment</p>
<p>5. Operate, Calibrate and perform routine maintenance on standard equipment found in a biotechnology laboratory.</p>	<p>Lecture Laboratory Experiments Reading and Problem-Solving Assignments</p>	<p>Section Examinations Final Comprehensive Examination Lab exercises and</p>

setting.	Solving Assignments Case Studies	reports
12. Design an experiment to demonstrate the quality control issues in a laboratory setting.	Lecture Small Group Discussions Laboratory Experiments Reading and Problem-Solving Assignments	Section Examinations Final Comprehensive Examination Lab exercises and reports
13. Plan and deliver an oral presentation and paper about relevant biotechnology topics	Lecture Small Group Discussions Laboratory Experiments Reading and Problem-Solving Assignments	Student41 82"8152.42 82.8

4. UV and Visible Spectrophotometry (2-3 experiments)
5. Quality Control (1 experiment)
6. If Possible, 1 Field Trip to a Biotech (or Related) Company to Acquire Knowledge in Use of Large Scale Instrumentation Not Available on Campus
7. Polymerase Chain Reaction and gel electrophoresis (1 experiment)
8. Aseptic technique as it pertains to microbial experiments and mammalian cell culture (3 experiments)
9. Bacterial Transformation (1 experiment)
10. Isolation of plasmid DNA (1 experiment)
11. Protein separation methods and electrophoresis (1 experiment)
12. Use of Computer Data Handling Systems (1 experiment)

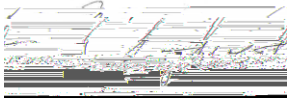
#### LEARNING MATERIALS:

Seidman, L.A. and Moore, C.J. (2009). *Basic Laboratory Methods for Biotechnology: Textbook and Laboratory Reference* (2<sup>nd</sup> ed.). Prentice Hall.

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

#### COURSE APPROVAL:

Prepared by: Linda R. Rehfuss, Ph.D. Biotechnology Instructor	Date: 11/1/2004
Board of Trustees Presentation	Date: 12/31/2004
VPAA/Provost Compliance Verification:	Date: 7/1/2009
Revised by: Kevin Lampe	Date: 2/2/2010
VPAA/Provost Compliance Verification: Dr. John C. Flynn, Jr.	Date: 6/22/2010
Revised by: Margaret Bryans Ph.D.	Date: 12/22/2012
VPAA/Provost or designee Compliance Verification: Victoria Bastecki-Perez, Ed.D.	Date: 12/2012
Revised by: Margaret Bryans Ph.D.	Date: 11/13/2013
VPAA/Provost or designee Compliance Verification: Victoria Bastecki-Perez, Ed.D.	Date: 11/2013
Revised by: Margaret Bryans Ph.D.	Date: 12/20/17
VPAA/Provost or designee Compliance Verification: Victoria Bastecki-Perez, Ed.D.	Date: 12/2017
Revised by: Margaret Bryans Ph.D.	Date: 11/5/2024
VPAA or designee Compliance Verification:	Date: 11/13/2024



*This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.*