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 a course fee. Refer to http://mc3.edu/adm-fin-aid/paying/tuition/course-fees for current rates.

REQUISITES:
Previous Course Requirements

CHE 131 Chemistry for Technology I, **or** CHE 151 Principles of Chemistry I (For students intending to transfer)

Concurrent Course Requirements

BIT 120 Introduction to Biotechnology may be taken concurrently, **or** may have been taken successfully in a prior semester

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHOD
1. Describe laboratory safety practices and implement them when using biological and chemical materials in class activities		

Define Good Laboratory Practices (GLP) and Good Manufacturing Practices (GMP).	Reading and Problem-Solving Assignments Case studies	
4. Develop a written SOP for a laboratory process or instrument.	Lecture Small Group Discussions Laboratory Experiments Reading and Problem-Solving Assignments	Section Examinations Final Comprehensive Examination Lab exercises and reports Written assignment
5. Operate, Calibrate and perform routine maintenance on standard equipment found in a biotechnology laboratory.	Lecture Laboratory Experiments Reading and Problem-Solving Assignments	Section Examinations Final Comprehensive Examination Lab exercises and reports
6. Prepare and standardize various strengths of molar, normal and percent solutions.	Lecture JETQqQQ EMC q247.85 56	

setting. Solving Assignments

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* (2nd ed.). Prentice Hall.

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

COURSE APPROVAL:

Prepared by: Linda R. Rehfuss, Ph.D. Date: 11/1/2004
Biotechnology Instructor
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:
Dr. Victoria Bastecki-Perez Date: 12/22/2012

Revised by: Margaret Bryans Ph.D. Date: 11/13/2017
VPAA/Provost or designee Compliance Verification: Date: 1/8/2018

. *It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.*