Central Carolina Community College
An Equal Opportunity College

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Bioprocess Technology
Credential: Certificate in Bioprocess Technology
C5044000

This program prepares individuals to enter the workforce in biological products manufacturing facilities. Course work includes computer or math skill development, exposure to the industrial work environment, basic bioprocessing operations, and a major course elective. Graduates should be qualified to become entry-level trainees in bioprocess manufacturing.

Program Length: 2 semesters
Career Pathway Options: Certificate in Bioprocess Technology, Associate in Applied Science Degree in Bioprocess Technology.
Program Site: Lee Campus – Day or Evening Program

Course Requirements for Bioprocess Manufacturing Technology Certificate

A. Required Major Core Courses (8 SHC)		
BPM 110	Bioprocess Practices	3-4-5
PTC 110	Industrial Environment	3-0-3
B. Other Courses (9 SHC)		
CIS 110	Introduction to Computers	2-2-3
	OR	
MAT 121	Algebra and Trigonometry	2-2-3
	OR	
MAT 161	College Algebra	3-0-3
ISC 121	Environmental Health and Safety	3-0-3
	Major Elective	3

Major Elective may be selected from the following:

BIO 110	Principles of Biology	3-3-4
CHM 131	Introduction to Chemistry	3-0-3
CHM 131A	Introduction to Chemistry Lab	0-3-1
CIS 110	Introduction to Computers	2-2-3
ISC 221	Statistical Quality Control	3-0-3
MAT 121	Algebra and Trigonometry	2-2-3
MAT 161	College Algebra	3-0-3

Total Semester Hours Credit required for graduation: 15

Semester Curriculum for Bioprocess Technology Certificate

1st Semester (Fall)		C-L-SHC
CIS 110	Introduction to Computers	2-2-3
	OR	
MAT 121	Algebra and Trigonometry	2-2-3
	OR	
MAT 161	College Algebra	3-0-3
PTC 110	Industrial Environment	3-0-3
ISC 121	Environmental Health and Safety	3-0-3
		9-0-9
		(8-2-9)

2nd Semester (Spring)		
BPM 110	Bioprocess Practices	3-4-5
	Major Elective	3
		8

Total Semester Hours Credit: 17

COURSE DESCRIPTIONS

BIO 110 Principles of Biology 3-3-4
This course provides a survey of fundamental biological principles for non-science majors. Emphasis is placed on basic chemistry, cell biology, metabolism, genetics, taxonomy, evolution, ecology, diversity, and other related topics. Upon completion, students should be able to demonstrate increased knowledge and better understanding of biology as it applies to everyday life. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural sciences/mathematics.

BPM 110 Bioprocess Practices 3-4-5
This course provides a study of plant operations including various plant utility systems and detailed study of the varied plant environments in a bioprocessing facility. Emphasis is placed on quality mindset and principles of validation through applications of monitoring procedures. Upon completion, students should be able to demonstrate the rigors of industry regulation and its necessity.

CHM 131 Introduction to Chemistry 3-0-3
Corequisites: CHM 131A
This course introduces the fundamental concepts of inorganic chemistry. Topics include measurement, matter and energy, atomic and molecular structure, nuclear chemistry, stoichiometry, chemical formulas and reactions, chemical bonding, gas laws, solutions, and acids and bases. Upon completion, students should be able to demonstrate a basic understanding of chemistry as it applies to other fields. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural sciences/mathematics.

CHM 131A Introduction to Chemistry Lab 0-3-1
Corequisites: CHM 131
This course is a laboratory to accompany CHM 131. Emphasis is placed on laboratory experiences that enhance materials presented in CHM 131. Upon completion, students should be able to utilize basic laboratory procedures and apply them to chemical principles presented in CHM 131. Also included are EMR, spectrophotometry, extraction, safety and feed analysis. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural sciences/mathematics.

CIS 110 Introduction to Computers 2-2-3
This course introduces computer concepts, including fundamental functions and operations of the computer. Topics include identification of hardware components, basic computer operations, security issues, and use of software applications. Upon completion, students should be able to demonstrate an understanding of the role and function of computers and use the computer to solve problems. *This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural science/mathematics (Quantitative Option).*

ISC 121 Envir Health and Safety 3-0-3
This course covers workplace environmental health and safety concepts. Emphasis is placed on managing the implementation and enforcement of environmental health and safety regulations and on preventing accidents, injuries, and illnesses. Upon completion, students should be able to demonstrate an understanding of basic concepts of environmental health and safety.

ISC 221 Statistical Qual Control 3-0-3
Prerequisites: Completion of curriculum mathematics requirement
This course covers the principles and techniques of statistical process control for the improvement of productivity. Emphasis is placed on basic statistics for quality control, organization and procedures for efficient quality control including inspections, process control, and tests of significance. Upon completion, students should be able to apply statistical principles and techniques to enhance production.

MAT 121 Algebra/Trigonometry I 2-2-3
Prerequisites: MAT 070 or MAT 080 or appropriate placement test scores
This course provides an integrated approach to technology and the skills required to manipulate, display, and interpret mathematical functions and formulas used in problem solving. Topics include simplification, evaluation, and solving of algebraic and radical functions; complex numbers; right triangle trigonometry; systems of equations; and the use of technology. Upon completion, students should be able to demonstrate an understanding of the use of mathematics and technology to solve problems and analyze and communicate results.

MAT 161 College Algebra 3-0-3
Prerequisites: MAT 080 or appropriate placement test scores
This course provides an integrated technological approach to algebraic topics used in problem solving. Emphasis is placed on applications involving equations and inequalities; polynomial, rational, exponential and logarithmic functions; and graphing and data analysis/modeling. Upon completion, students should be able to choose an appropriate model to fit a data set and use the model for analysis and prediction. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural sciences/mathematics for the Associate in Arts Degree.

PTC 110 Industrial Environment 3-0-3
This course introduces the pharmaceutical industry, including a broad overview of work in this field. Emphasis is placed on good manufacturing practices (GMP), work conduct, company organization, job expectations, personal safety, hygiene, and company rules and regulations. Upon completion, students should be able to follow good manufacturing practice regulations and inspect a pharmaceutical manufacturing facility for compliance with GMP.