



# Program Planning Guide

## Bioprocess Technology, Diploma (D50440)

**Program Length:** 3 semesters

**Program Sites:** Lee Main Campus; Distance Education - some courses may be available online or hybrid

**Career Pathway Options:** Associate in Applied Science Degree in Bioprocess Technology; Diploma in Bioprocess Technology

Suggested Course Schedule		Class	Lab	Work	Credits	Notes:
<b>1st Semester (fall)</b>						
ACA 122	College Transfer Success	0	2	0	1	
BPM 110	Bioprocess Practices	3	4	0	5	BIOWORK
CHM 131	Introduction to Chemistry	3	0	0	3	
CHM 131A	Introduction to Chemistry Lab	0	3	0	1	
PTC 110	Industrial Environment	3	0	0	3	BIOWORK
ENG 111	Writing & Inquiry	3	0	0	3	
	<b>Total Semester Hours</b>	12	9	0	16	
<b>2nd Semester (spring)</b>						
BPM 111	Bioprocess Measurements	3	3	0	4	
CIS 110	Introduction to Computers	2	2	0	3	
BIO 110	Principles of Biology	3	3	0	4	
Mathematics requirement, select one:						
MAT 121	Algebra/Trigonometry I	2	2	0	3	
MAT 171	Precalculus Algebra	3	2	0	4	Transferrable
	<b>Total Semester Hours</b>	10/11	10	0	14/15	
<b>3rd Semester (summer)</b>						
BPM 112	Upstream Bioprocessing	3	4	0	5	
BPM 113	Downstream Bioprocessing	3	3	0	4	
	<b>Total Semester Hours</b>	6	7	0	9	
<b>Total Semester Hours Required for Graduation: 39</b>						



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## Course Descriptions

### **ACA 122 College Transfer Success**

This course provides information and strategies necessary to develop clear academic and professional goals beyond the community college experience. Topics include the CAA, college policies and culture, career exploration, gathering information on senior institutions, strategic planning, critical thinking, and communications skills for a successful academic transition. Upon completion, students should be able to develop an academic plan to transition successfully to senior institutions. This course has been approved for transfer under the CAA and ICAA as a premajor and/or elective course requirement.

### **BIO 110 Principles of Biology**

*Corequisite: DRE 098 or appropriate placement test scores*

This course provides a survey of fundamental biological principles for non-science majors. Emphasis is placed on basic chemistry, cell biology, metabolism, genetics, 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 for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in Natural Sciences.

### **BPM 110 Bioprocess Practices**

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.

### **BPM 111 Bioprocess Measurements**

*Prerequisites: Take BPM 110*

This course covers a variety of physical measurements. Emphasis is placed on pH, temperature, pressure and flow rates, as well as spectrophotometry, and biochemical and chemical analysis methods. Upon completion, students should be able to demonstrate and perform many aspects of process monitoring.

### **BPM 112 Upstream Processing**

*Prerequisite: Take BPM 111*

This course introduces techniques involved in cell growth and fractionation. Topics include fermentation theory and application, as well as cell harvesting, cell disruption and fractionation methods. Upon completion, students should be able to grow cells, as well as isolate and collect various fractions.

### **BPM 113 Downstream Bioprocessing**

*Prerequisites: Take BPM 111*

This course introduces a variety of techniques involved in separation procedures. Topics include extraction and precipitation, concentration and molecular filtration methods, as well as different types of chromatography. Upon completion, students should be able to perform separation procedures with an understanding of industrial scale procedures

### **CHM 131 Introduction to Chemistry**

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 for transfer under the CAA and ICAA as a general education course in Natural Science.

**CHM 131A Introduction to Chemistry Lab**

*Corequisite: 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. This course has been approved for transfer under the CAA and ICAA as a general education course in Natural Science.

**CIS 110 Introduction to Computers**

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 for transfer under the CAA and ICAA as a general education course in Mathematics.

**COM 231 Public Speaking**

This course provides instruction and experience in preparation and delivery of speeches within a public setting and group discussion. Emphasis is placed on research, preparation, delivery, and evaluation of informative, persuasive, and special occasion public speaking. Upon completion, students should be able to prepare and deliver well-organized speeches and participate in group discussion with appropriate audiovisual support. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in Humanities/Fines Arts.

**ENG 111 Writing and Inquiry**

*Prerequisites: DRE 098 or ENG 002*

*Local Prerequisites: Take one: 1) ENG 011; 2) ENG 002; 3) DRE 098; 4) ENG 090; 5) ENG 095*

This course is designed to develop the ability to produce clear writing in a variety of genres and formats using a recursive process. Emphasis includes inquiry, analysis, effective use of rhetorical strategies, thesis development, audience awareness, and revision. Upon completion, students should be able to produce unified, coherent, well-developed essays using standard written English. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in English Composition.

**PTC 110 Industrial Environment**

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.