

PROGRAM APPROVAL APPLICATION
NEW or SUBSTANTIAL CHANGE or LOCALLY APPROVED
(This application may not exceed 3 pages)

Fill In Form

Biotechnology: Biomanufacturing

Proposed Program Title

Citrus

College

Citrus

District

Fall 2015

Projected Program Start Date

Jim Lancaster

Voting Member

Dean; Curriculum, CTE, & Cont. Ed

Title

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Phone Number

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E-mail Address

Goal(s) of Program (Check all that apply):

Career Technical Education (CTE)

Transfer

Other

Type of Program (Check all that apply):

A.S. Degree

A.A. Degree

Certificate of Achievement:

18+ semester (or 27+ quarter) units

12-18 semester (or 18-27 quarter) units

Reason for Approval Request: (Check One)

New Program

Substantial Change

Locally Approved

Program Information

Recommended Taxonomy of Program (TOP) Code **0430.00 - Biotechnology and Biomedical Technology***

Units for Major-Degree

N/A

Total Units for Degree

N/A

Required Units-Certificate

19

Written Form

1. Insert the description of the program as it will appear in the catalog.

Biomanufacturing is a diverse industry merging large-scale manufacturing practices with biotechnology applications. Companies in this growing sector manufacture a variety of products, such as therapeutics, clinical diagnostic tests, dietary supplements, and biofuels. The Biomanufacturing Certificate of Achievement at Citrus College prepares students for in-demand entry-level positions in the local biomanufacturing industry. Upon completion of the program, students will be prepared to seek employment as biological technicians, manufacturing production technicians, and quality control analysts. Students gain conceptual knowledge of biotechnology, as well as extensive hands-on laboratory experience with industry-standard tools and equipment. The program also emphasizes workforce readiness, including resume writing and job interview skills.

2. Provide a brief rationale for the program.

The bioscience industry in Los Angeles County is robust and has continued to expand despite the national economic downturn. At Citrus College, we strive to train our students for in-demand, high wage careers. In preparation for developing a CTE program in biotechnology, we toured numerous local companies and assembled an advisory body of over 20 professionals from our local region. The ensuing dialogue revealed that the majority of bioscience companies in our immediate area are involved in the large-scale manufacturing of pharmaceuticals and products derived from human plasma and breast milk. The Citrus College advisory body affirmed that the need for manufacturing technicians far exceeds their demand for research and development technicians or quality control microbiologists. As such, we have focused our program on training students to enter the biomanufacturing sector as entry-level technicians. Our faculty lead has worked closely with industry partners to ensure that our program and course objectives prepare students for the available positions at these companies. Furthermore, she spent five weeks completing a summer externship in which she shadowed manufacturing technicians to ensure that the key skills and competencies are addressed by our curriculum.

3. List all courses required for program completion, including core requirements, restricted electives and prerequisites. (Push Enter after each entry to begin a new line)

Course No.	Course Title	Units
BIOL 130	Fundamentals of Biotechnology I: Basic Laboratory Skills and Documentation	4
BIOL 135	Fundamentals of Biotechnology II: Biomanufacturing, Quality Control and Quality Assurance	4
ENGL 101 or ENGL 101H	Reading and Composition Reading and Composition—Honors	3 3
MATH 142 or MATH 150	Beginning and Intermediate Algebra II Intermediate Algebra	5 5
PHIL 108	Philosophy/Ethics	3

- Summarize the Labor Market Information and employment outlook (including citation of the source of the data) for students exiting the program.

Clean LMI for biomanufacturing does not exist. There are biological technicians, manufacturing production technicians, and quality control analysts that are pieces of the occupational profile. According to ONET, the majority of Biological Technicians possess a Bachelor’s degree. That being said, in the Citrus College Employment catchment area there is an 8.9% increase expected over the next 5 years and median earnings are \$20.40/hr (EMSI). Fullerton, PCC, and ELAC have related programs within the Citrus employment catchment; however, IPEDS did not have 2013 completion data for these institutions.

The best case for this new program is supported in the Center of Excellence October 2014 Life Science & Biotech Middle Skills Workforce Supply and Demand Analysis

“In the Los Angeles region (Los Angeles, Orange and Ventura counties) the supply of workforce ready students is not currently meeting demand for projected job openings. The shortage of students supplied to the regional labor market may be as many as 245 per year. The good news is that in the coming year (2014-15), colleges in the region are projected to supply an additional 60 trained students to the regional labor market. Though this will not completely close the gap, it is a promising start to addressing the demand.” (pg. 27)

“The supply analysis suggests that community college supply is approximately two-thirds of the capacity of community college programs across the state. The estimated annual capacity of programs is approximately 600 students. Estimated actual supply of workforce ready students annually is 400....The region-by-region gap analysis for the three key regions of the state reveal that the Los Angeles/Orange and San Diego regions appear to be under-supplying their labor markets with work ready biotechnicians.” (pg. 28)

Last, Dr. Wendie Jonhston, Director, LA/Orange County Biotech Center endorses the new program at Citrus College.

- List similar programs at other colleges in the Los Angeles and Orange County Region which may be adversely impacted. (Push Enter after each entry to begin a new line)

Colleges within Citrus’ “employment catchment area”

College	Program	Who you Contacted	Outcome of Contact
Pasadena City	Biotechnology	Paul Jarrell	Supports
Mt. SAC	Biotechnology	Jemma-Blake Judd	Waiting for response
EL Camino*	Biotechnology	Virginia Rapp	No Concerns
LATTC*	Biotechnology	Nicole Albo-Lopez	No Concerns
LA Valley*	Biotechnology	Laurie Nalepa	Waiting for response
Fullerton*	Biotechnology	Scott McKenzie	No concerns

* New programs or reactivated (less than a year old)

- Include any other information you would like to share.

The biomanufacturing courses in this program were developed using a criteria referenced model. The lead faculty spent the 2014 summer term on externship at various biotech/biomanufacturing companies observing and practicing the skills required to enter the industry. Curriculum was authored after the summer externship and reflects the performance expectations of the industry.