

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

**Fill In Form**

Biotechnology Proposed Program Title	Fall 2016 Projected Program Start Date
Citrus College College	Citrus Community College District District

**Contact Information**

Jim Lancaster Voting Member	Dean of Curriculum, Career/Technical, & Continuing Ed. Title
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**Goal(s) of Program (Check all that apply):**

Career Technical Education (CTE)       Transfer       Other

**Type of Program (Check all that apply):**

Certificate of Achievement 12-17 (or 17-27 quarter) units       Certificate of Achievement 18+ semester (or 27+ quarter) units  
 Associate of Science Degree       Associate of Arts Degree

**Reason for Approval Request (Check One):**

New Program       Substantial Change       Locally Approved

**Program Information**

0430.00	Recommended <a href="#">Taxonomy of Program (TOP) Code</a>
29-30	Units for Major-Degree
54-69	Total Units for Degree
N/A	Required Units-Certificate

**Written Form**

**1. Insert the description of the program as it will appear in the catalog. (See PCAH pp. 142 and 170)**

Biotechnology involves the application of biology to develop new products and technologies to combat disease, reduce our environmental impact, provide cleaner fuel sources, improve food production, and create safer industrial processes. The Citrus College Biotechnology A.S. degree includes a mix of basic science courses and hands-on laboratory classes designed to provide essential technical training and experiences necessary to thrive in this growing industry. Students will gain the conceptual knowledge, practical skills, and confidence to obtain entry-level employment as biological technicians, manufacturing production technicians, quality control technicians, and environmental monitoring technicians in bioscience laboratories and companies. The program emphasizes work readiness skills, such as resume writing, teamwork, and communication. This degree is intended for students who wish to enter the workforce upon completion.

**2. Provide a brief rationale for the program.**

In the fall of 2015, Citrus College launched a biotechnology program offering a Certificate of Achievement in Biomanufacturing. The response from Citrus students and our local industry partners, such as Grifols Biologicals, Prolacta Bioscience, and Gilead Sciences, has been overwhelming positive. The first course in the certificate filled during the Fall 2015 registration period within 48 hours with a full wait list. A second offering in the Winter 2016 intersession also filled quickly. Many of the students currently working toward the Biomanufacturing Certificate have expressed interest in completing an associate’s degree in biotechnology. From the industry perspective, our business advisory partners indicate that students with an associate’s degree would be competitive for career advancement opportunities. Ultimately, companies like Grifols are moving to hire entry-level candidates with a two-year degree.

**3. Summarize the Labor Market Information (LMI) and employment outlook (including citation for the source of the data) for students exiting the program. (See PCAH pp. 85-88, 136, 147, 148, 165, 168, and 176)**

The California Community College’s Centers of Excellence for Labor Market Research and the Life Sciences/Biotech Initiative recently undertook an analysis of supply and demand for bioscience technicians, who do not possess a bachelor’s degree (referred to as middle skills workers). Their October 2014 report titled “Supply and Demand Analysis: Life Sciences and Biotech Middle Skills Workforce in California” examined labor market data supplied by Economic Modeling Specialists Intl. (EMSI) and Burning Glass. The group found that community colleges in Los Angeles County supply a total of 31 workforce-ready trainees annually—under supplying the local biotechnology labor market by at least 245 middle skills workers each year. Based on the labor market figures, projections indicate an additional 12% growth for middle skills technicians in the Los Angeles area over the next 5 years. Furthermore, our advisors, including Grifols Biologicals, Gilead Sciences, and Prolacta Bioscience, anticipate hiring at least 100 entry-level technicians locally in the next couple of years (November 2014 advisory meeting).

Completion of an associate’s degree in biotechnology will better position our students to secure available high-wage positions in the local industry. According to the Biotech Middle Skills report, median hourly wages for biological technicians is \$20 across the state. In the Los Angeles region, the hourly wage can rise to over \$29 for manufacturing technicians. Overall, the average salary across the bioscience industry in Los Angeles County is \$72,052 annually, which is significantly higher than the average private sector salary of \$52,029. These data were reported in the 2014 report titled “Feasibility Assessment and Master Plan for Advancing the Bioscience Industry Cluster in Los Angeles County” by the Battelle Technology Partnership Practice. Given the labor shortage across the region, projected growth in our local catchment area, and high-wage opportunities, Citrus College proposes to bolster the STEM workforce by offering an associate’s degree in biotechnology.

**4. List similar programs at other colleges in the Los Angeles and Orange County Region which may be adversely impacted. (There is space for 10 listings, if you need more, please contact [laocrc@sccollege.edu](mailto:laocrc@sccollege.edu))**

College	Program	Who You Contacted	Outcome of Contact
Fullerton College	Biological Technician A.S.	Dr. Jo Wu	Contacted, no response
LA Trade Technical College	Biotechnology A.S. & Cert.	Dr. Martin Diaz	Supports
Pasadena City College	Biological Technology Cert.	Dr. Pamela Eversole-Cire	Supports
Santa Ana College	Biotechnology Technician Certificate	Dr. Kathleen Takahashi	Supports
Santiago Canyon College	Biotechnology A.S. & Cert.	Dr. Denise Foley	Supports
Irvine Valley College	Biotechnology	Dr. Emalee Mackenzie	Supports
_____	_____	_____	_____

5. List all courses required for program completion, including core requirements, restricted electives and prerequisites. (There is space for 20 listings, if you need more, please contact [laocrc.sccollege.edu](http://laocrc.sccollege.edu)). (See PCAH pp. 143 and 171)

Courses	Course Number	Course Title	Units
Required Course (Alternative to BIOT 108)	BIOT 107	Biotechnology: Transforming Society Through Biology	3.0
Required Course (Alternative to BIOT 107)	BIOT 108	Intro to Biotechnology: Real World Biology Applications	4.0
Required Course	BIOT 110	Biotechnology I: Basic Lab Skills and Documentation	5.0
Required Course	BIOT 150	Biotechnology II: Biomanufacturing & Quality Principles	4.0
Required Course	BIOT 125	Quality & Regulatory Practices in Biotechnology	3.0
Required Course	MATH 165	Introductory Statistics	4.0
Required Course (Alternative to CHEM 111/112)	CHEM 103 and CHEM 104	College Chemistry (series of two courses)	5.0 (each)
Required Course (Alternative to CHEM 103/104)	CHEM 111 and CHEM 112	General Chemistry (series of two courses)	5.0 (each)

6. Include any other information you would like to share.