

**NARRATIVE FOR CERTIFICATES**

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Program Name: General Biotechnology Certificate of Achievement
Date: 09/01/21
Department: Life Science

**ITEM 1. PROGRAM GOALS AND OBJECTIVES**

Identify the goals and objectives of the program. The stated goals and objectives of the program must be consistent with the mission of the community colleges as established by the Legislature in Education Code section 66010.4. Often, colleges will include the program level Student Learning Outcomes (SLOs) in this section that identify the program's goals and objectives.

The goal of the program is to provide necessary skillsets for the students to thrive in the Biotechnology & Biomedical Technology industry (TOP Codes: 043000) and attain a living wage. The program will also address the projected supply gap by providing workforce-ready graduates for the Biotechnology industries (SOC codes: 17-3029, 19-4021, 19-4031, 19-4099, and 51-9061).

**ITEM 2. CATALOG DESCRIPTION**

[Insert Catalog description from current Catalog below]

The Biotechnology certificate is an interdisciplinary certificate with coursework in Biotechnology, Plant Science, Chemistry, Statistics, and Biology. Students will be introduced to a large breadth of topics including basic techniques in biotechnology laboratories, molecular biology, plant engineering, molecular diagnostic, quality and biomanufacturing. The program focuses on the general biotechnician training with stackable specialization certificates and an associate degree in plant biotechnology.

**ITEM 3. PROGRAM REQUIREMENTS**

[Click the + button to the left of the table if you need to add more rows]

MAJOR COURSES			
Course	Course Title	Units	Sequence
<b>REQUIRED CORE</b>			
Biotech 002	Biotechnology I	4	Yr 1, Fall
<b>Biotech 003</b>	<b>Biotechnology II</b>	4	Yr 1, Spring
Chem 060 OR	Introduction To General Chemistry	5	Yr 1, Fall
Chem 101	General Chemistry I	5	Yr 1, Fall
<b>Biotech 385</b> OR	<b>Biotech Directed Study/ Internship III</b>	3	Yr 2, Fall
<b>Biotech 185</b> AND	<b>Biotech Directed Study/ Internship I</b>	1	Yr 2, Fall
<b>Biotech 285</b>	<b>Biotech Directed Study/ Internship II</b>	2	Yr 2, Spring
<b>ELECTIVES</b>			
Required Major Total:		16	
<b>TOTAL UNITS:</b>		16	

PROPOSED SEQUENCE		
Year	Semester	Units
Year 1	Fall	9 units
Year 1	Spring	4 units
Year 2	Fall and/or Spring	3 units

**ITEM 4. MASTER PLANNING**

Given the stated goals and objectives, this discussion addresses the role the proposed program will fulfill in the college’s mission and curriculum offerings, the placement of the proposed program in the district master plan, and how the program is appropriate to the objectives and conditions of higher education and community college education in California by confirming to statewide master planning (pursuant to Title 5 sections 55130(b)(6) and 55130(b)(7)).

This goal aligns with the college’s strategic master plan as follows:

- A.1. increase student completion of Associate degree in Biotechnology
- C.3. foster partnership with business and industry to increase career opportunities for students

Projected annual enrollment:

		<Year 1>		<Year 2>	
Course Department Number	Course Title	Annual # Sections	Annual Enrollment Total	Annual # Sections	Annual Enrollment Total
Biotech 002	Biotechnology I	1	20	1	20
Biotech 003	Biotechnology II	1	20	1	20

The Biotech program will be jointly offered by the Agriculture department and the Life Science department. Biotech 002 and Biotech 003 will be offered once a year through the Life Science department. **The new course, Biotech 003, will be a part of previously approved Agriculture Biotechnology program** and required for the completion of the high unit certificate of achievement (approved) and the Associate degree (approved). **This certificate (General Biotechnology – low unit with internship) will allow Pierce College to capture completion number for students who gain internships and possible employments through our internship programs funded by the NSF grant and the Strong Workforce funding.**

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Below is the most recent LMI data:

2018-2028 Occupational Employment Projections										
Los Angeles-Long Beach-Glendale Metropolitan Division										
(Los Angeles County)										
SOC Level <sup>[1]</sup>	SOC Code <sup>[2]</sup>	Occupational Title	Base Year Employment 2018	Projected Year Employment Estimate 2028	Numeric Change 2018-2028 <sup>[5]</sup>	Percent age Change 2018-2028	Median Hourly Wages <sup>[9]</sup>	Median Annual Wages <sup>[9]</sup>	Entry Level Education <sup>[10][11]</sup>	
4	19-1012	Food Scientists and Technologists	360	370	10	2.8%	\$36.99	\$76,936	Bachelor's degree	
4	19-1013	Soil and Plant Scientists	120	150	30	25.0%	\$0.00	\$0	Bachelor's degree	
4	19-1022	Microbiologists	350	390	40	11.4%	\$45.51	\$94,645	Bachelor's degree	
4	19-1029	Biological Scientists, All Other	2,070	2,450	380	18.4%	\$47.14	\$98,053	Bachelor's degree	
4	19-2031	Chemists	2,150	2,350	200	9.3%	\$34.23	\$71,202	Bachelor's degree	
4	19-2041	Environmental Scientists and Specialists, Including Health	2,250	2,390	140	6.2%	\$44.57	\$92,689	Bachelor's degree	
4	19-4011	Agricultural and Food Science Technicians	510	520	10	2.0%	\$0.00	\$0	Associate's degree	
4	19-4021	Biological Technicians	2,380	2,780	400	16.8%	\$22.76	\$47,341	Bachelor's degree	
4	19-4031	Chemical Technicians	1,510	1,600	90	6.0%	\$24.39	\$50,739	Associate's degree	
4	19-4099	Life, Physical, and Social Science Technicians, All Other	2,110	2,400	290	13.7%	\$26.80	\$55,742	Associate's degree	
4	51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	16,040	12,900	-3,140	-19.6%	\$19.08	\$39,702	High school diploma or equivalent	

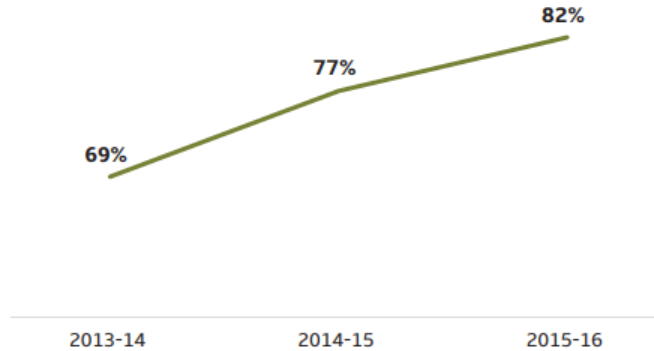
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Below are relevant Labor Market Data & excerpts of the Biotechnology sector in Los Angeles County from the Center of Excellence (<http://www.coecc.net/>):

**Student Employment Outcomes**

Data on community college students exiting life sciences/biotech programs in Los Angeles County shows a steady increase in those who obtained employment in a job closely related to their field of study, rising from 69% to 82% during the last three years of available data. On average, these students earned a median income of \$52,106 after exiting a life sciences/biotech program.

Exhibit 1. Students with a job closely related to their field of study

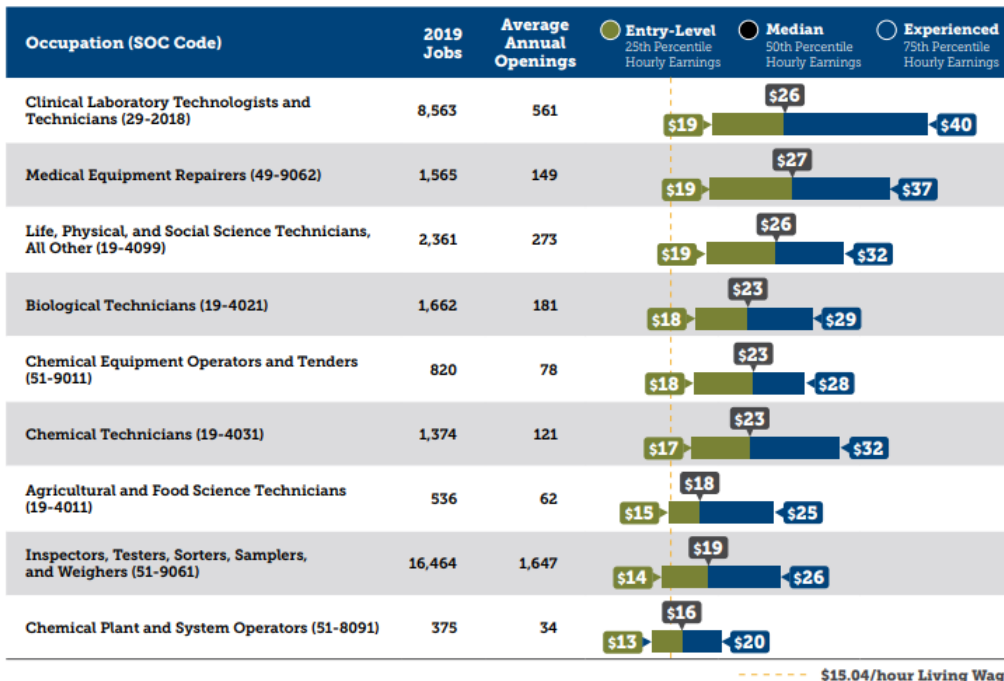


**Life Sciences/Biotech Occupations**


**Employment Demand Analysis**

Nine life sciences/biotech occupations account for 33,720 jobs in Los Angeles County. Combined they have 3,107 projected annual openings (new + replacement jobs). The largest occupation, in number of 2019 jobs, is inspectors, testers, sorters, samplers, and weighers. This occupation is projected to have the most annual job openings, 1,647.

Exhibit 3. Occupational employment, annual openings, and wages



**Life Sciences/Biotech Occupations**

 **Education & Training Supply Analysis**

In Los Angeles County, seven community colleges and one proprietary school/other training provider offer programs related to the life sciences/biotech occupations. In the 2019-20 academic year, community colleges conferred 93 awards, and in the 2018-19 academic year, proprietary schools and other training providers conferred five awards.

Exhibit 8. Total awards by academic year<sup>5</sup>

	2017	2018	2019
Community Colleges	88	90	93
Proprietary Schools & Other Training Providers	19	9	5

Exhibit 9. Education and training programs

Community Colleges	<ul style="list-style-type: none"> <li>· Biotechnology and Biomedical Technology (TOP 0430.00)</li> <li>· Biomedical Instrumentation (TOP 0934.60)</li> <li>· Electron Microscopy (TOP 0934.70)</li> <li>· Chemical Technology (TOP 0954.00)</li> <li>· Laboratory Science Technology (TOP 0955.00)</li> </ul>
Proprietary Schools and Training Providers	<ul style="list-style-type: none"> <li>· Biomedical Technology/Technician (CIP 15.0401)</li> </ul>

Supply-demand analysis on Biotechnician in the Los Angeles counties suggests a large gap. Pierce College has received funding through the Strong Workforce Regional (SWP) fund to help addresses this gap by developing a Biotechnology training program. We also recently received the NSF grant to help support the program infrastructure development (equipment and pathway for high schools – partnering with the LAUSD and 4-year Biotechnology program).