

Program Endorsement Brief: 0430.00 /Biotechnology and Biomedical Technology *Biological Technology – Laboratory Skills*

Los Angeles/Orange County Center of Excellence, March 2020

Summary Analysis

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to four middle-skill occupations: chemical technicians (19-4031); life, physical, and social science technicians, all other (19-4099); medical and clinical laboratory technicians (29-2012); and inspectors, testers, sorters, samplers, and weighers (51-9061); and one above middle-skill occupation: biological technicians (19-4021). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.¹ Although biological technicians require a bachelor's degree, they are included in this report because approximately one-third of workers in the field have completed some college or an associate degree. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for biological technology-related occupations in the region. **Therefore, the COE endorses this proposed program.** Reasons include:

Demand:

- Over the next five years, there is projected to be **4,489 jobs available annually** in the region due to new job growth and replacements, **which is more than the 3-year average of 165 awards** conferred by educational institutions in the region.
 - Life, Physical, and Social Science Technicians, all other (19-4099) SOC code includes a variety of related emerging occupations such as Quality Control Analysts (19-4099.01); however, not all of the included emerging occupations are solely related to biological technology.
 - Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061) work in many different manufacturing sub-industries, not only biological technology. Therefore, the data for this occupation is likely overstated, as it includes figures from across all industries.

¹ The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

- Over the past 12 months, there were **3,614 online job postings related to the five occupations of interest**. The highest number of job postings were for laboratory technician, laboratory assistant, quality control technician, quality assurance technician, and quality technician.
- The national-level educational attainment data indicates between **35.2% and 42.2% of workers in the field have completed some college or an associate degree**.
- **Entry-level wages** for three of the five occupations (Chemical Technicians (19-4031); Life, Physical, and Social Science Technicians, All Other (19-4099); and Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)) **are lower than the California Family Needs Calculator hourly wage** for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County)².
 - **Experienced workers can expect to earn between \$26.18 and \$37.90, which is higher than the California Family Needs Calculator wage estimates for both counties.**

Supply:

- **Nine community colleges** in the region offer programs related to biological technology, conferring an average of **104 awards annually** between 2016 and 2019.
- Between 2013 and 2016, there were an average of **61 awards conferred annually** in related training programs by one non-community college institution in the region.

² Living wage data was pulled from California Family Needs Calculator on 3/2/20. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for five biological technician-related occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 2% through 2023. However, there will be nearly 4,500 job openings per year through 2023 due to retirements and workers leaving the field.

NOTE: this demand may be inflated for the following reasons:

- Life, Physical, and Social Science Technicians, all other (19-4099) SOC code includes a variety of related emerging occupations such as Quality Control Analysts (19-4099.01); however, not all of the included emerging occupations are solely related to biological technology. Therefore, the data in Exhibit 1 is likely overstated for biological technician occupations.
- Emsi uses a single aggregate code that combines Medical and Clinical Laboratory Technologists (29-2011), which is an above middle-skill occupation, and Medical and Clinical Laboratory Technicians (29-2012). Since these two occupations are combined within the dataset, it is likely that the demand and wage data is overstated. Data is shown for Clinical Laboratory Technologists and Technicians (29-2018).
- Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061) work in many different manufacturing sub-industries, not only biological technology. Therefore, the data for this occupation is likely overstated, as it includes figures from across all industries.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

Geography	2018 Jobs	2023 Jobs	2018-2023 Change	2018-2023 % Change	Annual Openings
Los Angeles	30,402	29,491	(911)	(3%)	3,093
Orange	13,021	12,983	(38)	(0%)	1,396
Total	43,423	42,474	(949)	(2%)	4,489

Wages — Typical entry-level hourly wages for these biological technology occupations throughout the region are between \$14.56 and \$19.00.⁴ Entry-level wages for three of these five occupations are lower than the California Family Needs Calculator hourly wage for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County).⁵ Experienced workers can expect to earn between \$26.18 and \$37.90, which is higher than the California Family Needs Calculator wage estimates for both counties. Wage information, by county, is included in Appendix A.

³ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

⁴ Entry-level wage is defined as the twenty-fifth percentile hourly wage. Wages for experienced workers are defined as the seventy-fifth percentile hourly wage.

⁵ Living wage data was pulled from California Family Needs Calculator on 3/2/20. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

Job Postings — There were 3,614 online job postings for biological technology-related occupations listed in the past 12 months. The highest number of job postings were for laboratory technician, laboratory assistant, quality control technician, quality assurance technician, and quality technician. The top skills were: quality assurance and control, chemistry, data entry, good manufacturing practices (GMP), and calibration. The top three employers, by number of job postings, in the region were: UCLA Health, Quest Diagnostics, and UC Irvine Health. Of the 3,614 online job postings, 60% list a minimum education requirement.

Educational Attainment — The Bureau of Labor Statistics (BLS) lists the following education levels for each of these middle and above-middle skill biological technology occupations:

- Bachelor’s degree: Biological Technicians
- Associate degree: Chemical Technicians; Life, Physical, and Social Science Technicians, All Other; Clinical Laboratory Technologists and Technicians
- High school diploma: Inspectors, Testers, Sorters, Samplers, and Weighers

The national-level educational attainment data indicates between 35.2% and 42.2% of workers in the field have completed some college or an associate degree. Of the 60% of biological technology job postings listing a minimum education requirement in Los Angeles/Orange County, 81% (1,766) requested a high school diploma and 19% (401) requested an associate degree.

Supply

Community College Supply — Exhibit 2 shows the annual and three-year average number of awards conferred by community colleges in the related TOP codes: Biotechnology and Biomedical Technology (0430.00) and Laboratory Science Technology (0955.00). The colleges with the most completions in the region are: Citrus and Pasadena. During 2019, there were five other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0430.00	Biotechnology and Biomedical Technology	Citrus	18	16	19	18
		LA Mission	-	14	21	12
		LA Trade-Tech	3	5	2	3
		Pasadena	16	19	18	18
		LA Subtotal	37	54	60	50
		Fullerton	4	3	18	8
		Irvine Valley	8	13	25	15
		Santa Ana	13	13	11	12
		Santiago Canyon	-	-	11	4
		OC Subtotal	25	29	65	40
Supply Subtotal/Average			62	83	125	90

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0955.00	Laboratory Science Technology	LA Trade-Tech	21	14	-	12
		Mt San Antonio	2	2	2	2
Supply Subtotal/Average			23	16	2	14
Supply Total/Average			85	99	127	104

Non-Community College Supply — It is important to consider the supply from non-community college institutions in the region that provide training programs for biological technology occupations. Exhibit 3 shows the annual and three-year average number of awards conferred by one institution in the related Classification of Instructional Programs (CIP) Code: Biomedical Technology/Technician (15.0401). Due to different data collection periods, the most recent three-year period of available data is from 2013 to 2016. Between 2013 and 2016, non-community college institutions in the region conferred an average of 61 awards annually in related training programs.

Exhibit 3: Regional Non-Community College awards, 2013-2016

CIP Code	Program	College	2013-2014 Awards	2014-2015 Awards	2015-2016 Awards	3-Year Award Average
15.0401	Biomedical Technology/Technician	Southern California Institute of Technology	59	61	62	61
Supply Total/Average			59	61	62	61

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Biological Technicians (19-4021)	2,164	2,251	87	4%	225	\$19.10	\$24.27	\$31.14
Chemical Technicians (19-4031)	1,387	1,372	(15)	(1%)	129	\$15.02	\$19.28	\$27.21
Life, Physical, and Social Science Technicians, All Other (19-4099)	1,883	1,944	61	3%	232	\$17.33	\$23.30	\$29.33
Clinical Laboratory Technologists and Technicians (29-2018)	8,354	8,777	423	5%	604	\$17.78	\$24.47	\$37.44
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	16,613	15,147	(1,466)	(9%)	1,903	\$14.48	\$19.07	\$26.04
Total	30,402	29,491	(911)	(3%)	3,093			

Exhibit 5. Orange County

Occupation (SOC)	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Biological Technicians (19-4021)	685	696	11	2%	67	\$18.67	\$23.73	\$30.44
Chemical Technicians (19-4031)	641	672	31	5%	67	\$15.27	\$19.59	\$27.65
Life, Physical, and Social Science Technicians, All Other (19-4099)	758	811	53	7%	100	\$16.95	\$22.80	\$28.66
Clinical Laboratory Technologists and Technicians (29-2018)	2,954	3,198	244	8%	235	\$18.66	\$25.69	\$39.30
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	7,984	7,606	(378)	(5%)	927	\$14.74	\$19.40	\$26.47
Total	13,021	12,983	(38)	(0%)	1,396			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Biological Technicians (19-4021)	2,848	2,947	99	3%	292	\$19.00	\$24.14	\$30.97
Chemical Technicians (19-4031)	2,028	2,044	16	1%	196	\$15.10	\$19.38	\$27.35
Life, Physical, and Social Science Technicians, All Other (19-4099)	2,642	2,755	113	4%	332	\$17.24	\$23.15	\$29.13
Clinical Laboratory Technologists and Technicians (29-2018)	11,308	11,975	667	6%	838	\$18.00	\$24.80	\$37.90
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	24,597	22,753	(1,844)	(7%)	2,830	\$14.56	\$19.17	\$26.18
Total	43,423	42,474	(949)	(2%)	4,489			

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- Employment Development Department, Unemployment Insurance Dataset
- Living Insight Center for Community Economic Development
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

For more information, please contact:

Juan Madrigal, Assistant Director
Los Angeles/Orange County Center of Excellence
jmadrigal@mtsac.edu
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