CENTER OF EXCELLENCE FOR LABOR MARKET RESEARCH
LOS ANGELES

Labor Market Analysis: 0954.00 - Chemical Technology

Chemical Technology– Associate Degree; Certificate of Achievement (for-credit)

Los Angeles Center of Excellence, May 2025

Program Endorsement:	Endorsed: All Criteria Met ☐	Endorsed: Some Criteria Met ☒	Not Endorsed ☐

Program Endorsement Criteria		
Supply Gap:	Yes ☑	No ☐
Living Wage: (Entry-Level, 25th)	Yes ☐	No ☑
Education:	Yes ☑	No ☐
Emerging Occupation(s)		
Yes ☐		No ☑

SUMMARY

This report analyzes whether local labor market demand is being met by community college programs aligned with the identified middle-skill occupations[1] or whether a shortage of workers exists. Labor market demand is measured by annual job openings while education supply is measured by the number of awards (degrees and certificates) conferred on average each year.

Based on the available data, there appears to be a supply gap for the five identified middle-skill occupations in the region. While entry-level wages are lower than the self-sufficiency standard wage in both Los Angeles and Orange counties, more than half of current workers in the field have completed some college/associate degree or less education as their highest level of educational attainment.

<u>Recommendation:</u> Due to two program endorsement criteria being met, the Los Angeles Center of Excellence for Labor Market Research (LA COE) endorses this proposed program.

Key Findings

Supply Gap

- 1,024 annual job openings are projected in the region through 2028. This number is greater than the three-year average of 599 awards conferred by educational institutions in the region.

[1] Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree. 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.

Living Wage

- 80% of annual job openings for these chemical technology occupations have entry-level wages **below** Los Angeles County's self-sufficiency standard hourly wage ($24.03/hour).[2]

Educational Attainment

- 56% of the annual job openings typically require an associate degree for these middle-skill occupations related to chemical technology in the LA/OC region.
- 26%-46% of workers in the field have completed some college or an associate degree, according to national educational attainment data.
    - 53%-86% have completed an associate degree or less education.

Community college supply

- 17 community colleges issued awards related to chemical technology in the greater LA/OC region.
- 536 awards (degrees and certificates) were conferred on average each year between 2022 and 2024.

Other postsecondary supply

- 3 educational institutions in the LA/OC region have conferred awards in programs related to chemical technology over the past three years.
- 63 awards were conferred on average each year by other postsecondary institutions throughout the greater LA/OC region between 2021 and 2023.

TARGET OCCUPATIONS

LA COE prepared this report to provide regional labor market and postsecondary supply data related to middle-skill chemical technology occupations. For full occupation descriptions, please see Appendix.

- ***Food Science Technicians* (19-4013)**[3]
- ***Biological Technicians* (19-4021)**[4]
- ***Chemical Technicians* (19-4031)**[5]
- ***Environmental Science and Protection Technicians* (19-4042)**[6]
- ***Water and Wastewater Treatment Plant and System Operators* (51-9031)**[7]

OCCUPATIONAL DEMAND

Exhibit 1 shows the five-year occupational demand projections for these middle-skill chemical technology occupations. In the greater Los Angeles/Orange County region, these chemical technology occupations are projected to increase by 2% through 2028. There will be more than

[2] Center for Women's Welfare, University of Washington. (2024). *The self-sufficiency standard for California 2024.* http://selfsufficiencystandard.org/California.
[3] Food Science Technicians (bls.gov)
[4] Biological Technicians (bls.gov)
[5] Chemical Technicians (bls.gov)
[6] Environmental Science and Protection Technicians (bls.gov)
[7] Water and Wastewater Treatment Plant and System Operators (bls.gov)

1,000 job openings per year through 2028 due to job growth and replacements. The majority of jobs in 2023 for these middle-skill chemical technology occupations (74%) were located in Los Angeles County.

Exhibit 1: Current employment and occupational demand, Los Angeles and Orange counties[8]

Geography	2023 Jobs	2028 Jobs	2023-2028 Change	2023-2028 % Change	Annual Openings
Los Angeles	6,382	6,514	132	2%	756
Orange	2,296	2,337	41	3%	269
Total	**8,678**	**8,851**	**173**	**2%**	**1,024**

Detailed Occupation Data

Exhibit 2 displays the current employment and projected occupational demand for each of the target occupations in Los Angeles County. Positive scores for automation resilience[9] reflect a lower-than-average threat of the occupation(s) being replaced by automation, while negative scores reflect a greater-than-average risk of automation. The average percentage of workers aged 55+ across all occupations in the Los Angeles/Orange County region is 26%; occupations with a larger share of workers aged 55 and older typically have greater replacement needs to offset the amount of impending retirements. On average, 81% of workers across all occupations in California are employed full-time.

Exhibit 2: Detailed employment and occupational demand, Los Angeles County[10]

Occupation	2023 Jobs	2028 Jobs	5-Yr % Change	Annual Openings	Auto-mation Resilience	% Aged 55 and older	% Full Time Workers
Food Science Technicians	634	625	(1%)	84	5.2	28%	100%
Biological Technicians	1,362	1,442	6%	188	9.6	15%	Data unavail.
Chemical Technicians	1,639	1,571	(4%)	185	(4.6)	27%	100%
Environmental Science and Protection Technicians, Including Health	1,233	1,276	3%	135	11.5	19%	Data unavail.
Water and Wastewater Treatment Plant and System Operators	1,515	1,601	6%	164	(4.1)	27%	100%
Total	**6,383**	**6,515**	**2%**	**756**	**-**	**-**	**-**

[8] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.
[9] Automation risk is calculated based on the percentage of time spent on high-risk compared to low-risk work, the number of high-risk jobs in compatible occupations, and the overall industry automation risk.
[10] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

WAGES

The labor market endorsement in this report considers the entry-level hourly wages for these middle-skill chemical technology occupations in Los Angeles County as they relate to the county's self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater Los Angeles/Orange County region.

Los Angeles County

The majority, 78%, of annual openings for middle-skill chemical technology occupations have entry-level wages below the self-sufficiency standard wage for one adult ($24.03 in Los Angeles County). Typical entry-level hourly wages are in a range between $21.15 and $30.32. (Exhibit 3). One occupation has entry-level wages above the self-sufficiency standard wage:

- *Water and wastewater treatment plant and system operators*, $30.32

Experienced workers can expect to earn wages between $30.18 and $46.25, which are higher than the self-sufficiency standard.

Exhibit 3: Earnings for occupations in Los Angeles County

Occupation	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)	Median Annual Earnings*
Food Science Technicians	$21.15	$24.27	$30.18	$50,500
Biological Technicians	$23.62	$31.29	$39.12	$65,100
Chemical Technicians	$21.64	$24.83	$31.59	$51,600
Environmental Science and Protection Technicians, Including Health	$23.01	$29.05	$39.38	$60,400
Water and Wastewater Treatment Plant and System Operators	$30.32	$38.13	$46.25	$79,300

*Rounded to the nearest $100

Orange County

The majority, 86%, of annual openings for middle-skill chemical technology occupations have entry-level wages below the self-sufficiency standard wage for one adult ($27.13 in Orange County). Typical entry-level hourly wages are in a range between $20.77 and $27.43 (Exhibit 4). One occupation has entry-level wages above the self-sufficiency standard wage:

- *Water and wastewater treatment plant and system operators*, $27.43

Experienced workers can expect to earn wages between $29.65 and $41.93, which are higher than the self-sufficiency standard.

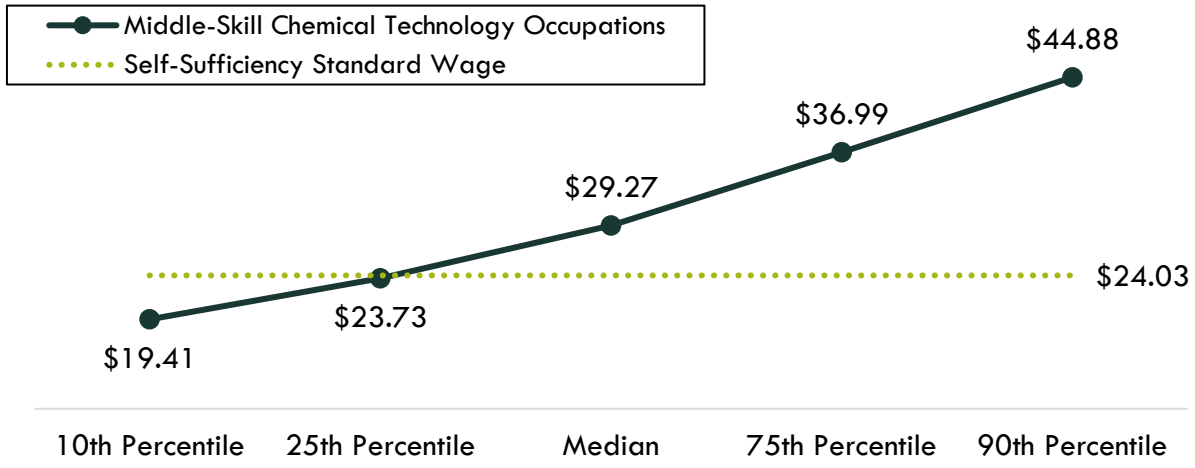
Exhibit 4: Earnings for occupations in Orange County

Occupation	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)	Median Annual Earnings*
Food Science Technicians	$20.77	$23.84	$29.65	$49,600
Biological Technicians	$22.51	$29.82	$37.29	$62,000
Chemical Technicians	$22.36	$25.65	$32.63	$53,400
Environmental Science and Protection Technicians, Including Health	$22.24	$28.05	$38.00	$58,400
Water and Wastewater Treatment Plant and System Operators	$27.43	$34.54	$41.93	$71,900

*Rounded to the nearest $100

Across the greater Los Angeles and Orange County region, the average entry-level hourly earnings for the occupations in this report are $23.73; this is above the living wage for one single adult in Los Angeles County ($24.03). Exhibit 5 shows the average hourly wage for the occupations in this report, for entry-level to experienced workers.

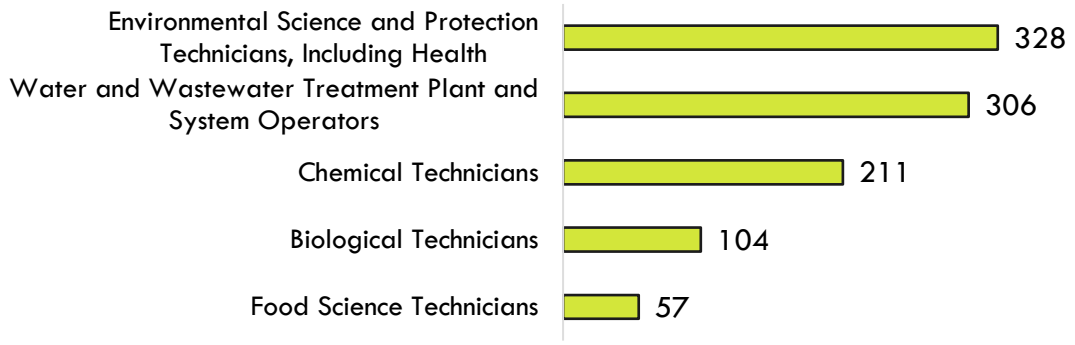
Exhibit 5: Average hourly earnings for middle-skill chemical technology occupations, Los Angeles and Orange counties



JOB POSTINGS

There were 1,006 online job postings related to middle-skill chemical technology occupations listed in the past 12 months in Los Angeles and Orange counties. Exhibit 6 displays the number of job postings by occupation. The majority of job postings (33%) were for *environmental science and protection technicians, including health*, followed by *water and wastewater treatment plant and system operators* (30%) and *chemical technicians* (21%).

Exhibit 6: Job postings by occupation (last 12 months), Los Angeles and Orange counties



Job postings were analyzed for the most common job titles, skills, and employers associated with the target occupations in this report (Exhibit 7).

Exhibit 7: Most commonly requested job titles, skills and employers in job postings, Los Angeles and Orange counties

Top Job Titles	Top Skills	Top Employers
• Environmental technicians • Sanitation supervisors • Environmental field technicians • Microbiology technicians • Sanitation managers • Chemical technicians • Wastewater treatment operators	• Chemistry • Food safety and sanitation • Wastewater • Auditing • Sewage treatments • Biology • Water treatment • Good manufacturing practices • Project management	• Aerotek* • Actalent* • Eurofins • Montrose Environmental Group • Tetra Tech • Transdev • Access Healthcare • Michelson Laboratories • Certified Laboratories

*Staffing company

In the greater Los Angeles/Orange County region, 59% of the middle-skill chemical technology occupations job postings listed a minimum educational requirement. Exhibit 8 details the number and percentage of job postings by educational level.

Exhibit 8: Education levels requested in job postings for middle-skill chemical technology occupations, Los Angeles and Orange counties

Education Level	Job Postings	% of Job Postings
Bachelor's degree	128	22%
Associate degree	55	9%
High school diploma or vocational training	410	69%

EDUCATIONAL ATTAINMENT

In the greater Los Angeles/Orange County region, the majority of annual job openings (56%) typically require an associate degree (Exhibit 9). Furthermore, the national-level data indicates between 26% and 46% of workers in the field have completed some college or an associate degree as their highest level of educational attainment, while 53%-86% have completed an associate degree or less education. The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the occupations in this report:

Exhibit 9: Entry-level education preferred by employers nationally, Bureau of Labor Statistics

Occupation	Education Level
Food Science Technicians	Associate degree
Biological Technicians	Bachelor's degree
Chemical Technicians	Associate degree
Environmental Science and Protection Technicians, Including Health	Associate degree
Water and Wastewater Treatment Plant and System Operators	High school diploma or equivalent

EDUCATIONAL SUPPLY

Community College Supply

Exhibit 10 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are Santiago Canyon, Citrus, and Santa Monica. Currently, there are no other postsecondary institutions in the greater LA/OC region that have conferred postsecondary awards for chemical technology in the past three years.

Exhibit 10: Regional community college awards (certificates and degrees), 2022-2024

TOP Code	Program	College	2021-22 Awards	2022-23 Awards	2023-24 Awards	3-Year Average
0303.00	Environmental Technology	Mt San Antonio	-	-	1	0
		Rio Hondo	14	11	11	12
		Santa Monica	57	30	42	43
		LA Subtotal	**71**	**41**	**54**	**55**
		Irvine	8	1	2	4
		Saddleback	1	-	-	0
		Santiago Canyon	2	2	1	2
		OC Subtotal	**11**	**3**	**3**	**6**
	Supply Subtotal/Average		**82**	**44**	**57**	**61**
0430.00	Biotechnology and	Citrus	9	14	20	14
		Compton	0	0	2	1

TOP Code	Program	College	2021-22 Awards	2022-23 Awards	2023-24 Awards	3-Year Average
	Biomedical Technology	East LA	4	0	2	2
		Glendale	0	12	16	9
		LA Mission	38	42	47	42
		LA Pierce	-	-	5	2
		LA Trade	13	3	7	8
		Pasadena	33	28	27	29
		West LA	-	7	9	5
		LA Subtotal	**97**	**106**	**135**	**113**
		Fullerton	3	12	39	18
		Irvine	23	11	5	13
		Santa Ana	13	20	55	29
		Santiago Canyon	16	57	86	53
		OC Subtotal	**55**	**100**	**185**	**113**
	Supply Subtotal/Average		**152**	**206**	**320**	**226**
0954.00	Chemical Technology	East LA	2	1	4	2
		LA Trade	11	-	3	5
		LA Subtotal	**13**	**1**	**7**	**7**
	Supply Subtotal/Average		**13**	**1**	**7**	**7**
0955.00	Laboratory Science Technology	Mt San Antonio	4	2	4	3
		LA Subtotal	**4**	**2**	**4**	**3**
	Supply Subtotal/Average		**4**	**2**	**4**	**3**
0958.00	Water and Wastewater Technology	Citrus	37	46	39	41
		LA Trade	23	29	27	26
		LA Subtotal	**60**	**75**	**66**	**67**
		Santiago Canyon	111	220	184	172
		OC Subtotal	**111**	**220**	**184**	**172**
	Supply Subtotal/Average		**171**	**295**	**250**	**239**
	Supply Total/Average		**422**	**548**	**638**	**536**

Exhibit 11: Regional community college awards (certificates and degrees), 2022-2024

Award Type	# of Awards	% of Awards
A.A./A.S. degrees	116	22%
Certificates	388	72%
Noncredit awards	32	6%
Totals	**536**	**100%**

Other Postsecondary Supply

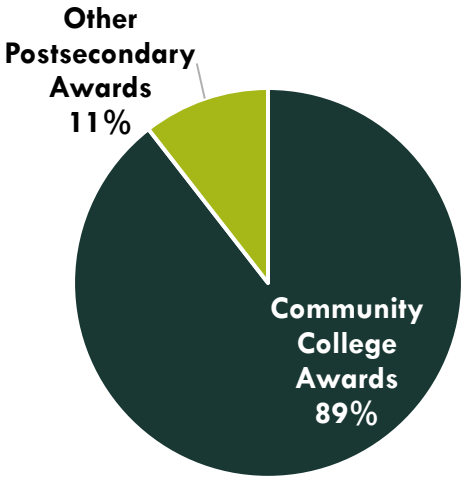
For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for chemical technology. Exhibit 12 shows the number of awards conferred by these institutions in relevant programs. Due to different data collection periods, the most recent data is from 2021 to 2023. Between 2021 and 2023, other postsecondary college institutions in the region conferred an average of 63 bachelor's and sub-baccalaureate awards. Sub-baccalaureate awards include associate degrees, postsecondary awards, and other academic awards that typically take fewer than four years to complete. Of the awards in Exhibit 12, the majority (78%) were sub-baccalaureate awards (49 awards), followed by bachelor's degrees (14 awards).

Exhibit 12: Other regional postsecondary awards, 2021-2023

CIP Code	Program	Postsecondary Institution	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
15.0401	Biomedical Technology/ Technician	Southern California Institute of Technology	50	39	57	49
26.1104	Computational Biology	Chapman University	-	-	1	0
		USC	8	16	18	14
		Supply Total/Average	**58**	**55**	**76**	**63**

Exhibit 13 shows the proportion of community college awards conferred in the greater Los Angeles/Orange County region compared to the number of other postsecondary awards for the programs in this report. The majority of awards conferred in these programs are awarded by community colleges in the greater Los Angeles/Orange County region.

Exhibit 13: Percentage of community college awards compared to other postsecondary institution awards in the Los Angeles/Orange County region



APPENDIX: OCCUPATION DESCRIPTIONS

LA COE prepared this report to provide regional labor market supply and demand data related to these target occupations:

- ***Food Science Technicians* (19-4013)** Work with food scientists or technologists to perform standardized qualitative and quantitative tests to determine physical or chemical properties of food or beverage products. Includes technicians who assist in research and development of production technology, quality control, packaging, processing, and use of foods.[11]
- ***Biological Technicians* (19-4021)** Assist biological and medical scientists. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, collect data and samples, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.[12]
- ***Chemical Technicians* (19-4031)** Conduct chemical and physical laboratory tests to assist scientists in making qualitative and quantitative analyses of solids, liquids, and gaseous materials for research and development of new products or processes, quality control, maintenance of environmental standards, and other work involving experimental, theoretical, or practical application of chemistry and related sciences.[13]
- ***Environmental Science and Protection Technicians* (19-4042)** Perform laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health, under the direction of an environmental scientist, engineer, or other specialist. May collect samples of gases, soil, water, and other materials for testing.[14]
- ***Water and Wastewater Treatment Plant and System Operators* (51-9031)** Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or wastewater.[15]

[11] Food Science Technicians (bls.gov)
[12] Biological Technicians (bls.gov)
[13] Chemical Technicians (bls.gov)
[14] Environmental Science and Protection Technicians (bls.gov)
[15] Water and Wastewater Treatment Plant and System Operators (bls.gov)

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DATA SOURCES

- O*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)