









Laboratory Science Occupations

Baccalaureate Labor Market Analysis

March 2024

SUMMARY

BDP PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED EDUCATION FOR MAJORITY OF OCCUPATIONS ANALYZED
 Proceed with Caution	 	 	<input type="checkbox"/> Doctorate Degree <input type="checkbox"/> Master's Degree <input checked="" type="checkbox"/> Bachelor's Degree <input checked="" type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less than a HS Diploma <input type="checkbox"/> Apprenticeship
DOES A SIMILAR PROGRAM EXIST AT A UC OR CSU?	EXISTING ASSOCIATE DEGREE PROGRAM IN REGION?	NUMBER OF ANNUAL JOB OPENINGS	
YES, a UC or CSU currently offers a similar program	 	<div style="background-color: #4a7c9c; color: white; padding: 2px; text-align: center; font-weight: bold;">HIGH</div> 	

The San Diego & Imperial Center of Excellence (COE) developed this brief to determine if an unmet workforce need exists for a baccalaureate degree program (BDP) for [Laboratory Science Occupations](#). According to Assembly Bill No. 927, community college districts seeking approval for a BDP must 1) not offer “program curricula already offered by the California State University or the University of California” systems, 2) “continue to offer an associate degree program in the same academic subject”¹ of the proposed BDP, and 3) “provide evidence of unmet workforce needs.”²

This brief recommends that the San Diego & Imperial Counties Community Colleges proceed with caution when developing a BDP for [Laboratory Science Occupations](#) because although 1) **entry-level and median wages are above the living wage** and 2) **a supply gap exists for these occupations**, a similar program already exists in the UC or CSU systems.

¹ “The bill would require a community college district to continue to offer an associate degree program in the same academic subject for which a baccalaureate degree program has been approved, unless the community college district has received approval from the chancellor to eliminate the associate degree program, as specified.”

² “AB-927 Public postsecondary education: community colleges: statewide baccalaureate degree.” California Legislative Information. Accessed 09/05/2023. leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927

INTRODUCTION

According to Assembly Bill No. 927, community college districts seeking approval to offer a baccalaureate degree program (BDP) must:³

1. Not offer a BDP or “program curricula already offered by the California State University or the University of California”
2. “Continue to offer an associate degree program in the same academic subject for which a baccalaureate degree program has been approved”
3. Identify and document unmet workforce needs “in the local community or region of the district”

To determine the need for a new BDP, this brief examines labor market information (LMI) for **Laboratory Science Occupations** using the following Standard Occupational Classification (SOC)⁴ codes:

- **Biological Technicians** (SOC 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.
- **Chemical Technicians** (SOC 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.
- **Environmental Science and Protection Technicians, Including Health** (SOC 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.
- **Geological Technicians, Except Hydrologic Technicians** (SOC 19-4043): Assist scientists or engineers in the use of electronic, sonic, or nuclear measuring instruments in laboratory, exploration, and production activities to obtain data indicating resources such as metallic ore, minerals, gas, coal, or petroleum. Analyze mud and drill cuttings. Chart pressure, temperature, and other characteristics of wells or bore holes.

³ “AB-927 Public postsecondary education: community colleges: statewide baccalaureate degree.” California Legislative Information. Accessed 09/05/2023. leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927

⁴ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. [bls.gov/soc/](https://www.bls.gov/soc/).

According to available LMI, employers require a minimum educational attainment ranging from of an associate degree to a bachelor’s degree for [Laboratory Science Occupations](#). On average, the entry-level hourly earnings for [Laboratory Science Occupations](#) are \$21.61, which is more than the \$18.43 per hour living wage for a single adult in San Diego County.⁵

SOC Title (SOC Code)	Entry-Level Hourly Earnings ⁶	Median Hourly Earnings	Typical Entry-Level Education
Biological Technicians (19-4021)	\$22.04	\$27.13	Bachelor's degree
Geological Technicians, Except Hydrologic Technicians (19-4043)	\$21.19	\$25.98	Associate degree
Chemical Technicians (19-4031)	\$20.48	\$24.54	Associate degree
Environmental Science and Protection Technicians, Including Health (19-4042)	\$18.91	\$25.12	Associate degree

The following sections “assess the workforce value of [a] proposed baccalaureate degree program” for [Laboratory Science Occupations](#) in accordance with AB-927.⁷

BDP PROPOSAL REQUIREMENTS

UC and CSU Programs

According to AB-927, community colleges must not offer a BDP or program curricula already offered by the CSU or UC systems. To determine if a BDP already exists for [Laboratory Science Occupations](#), the COE examined CSU and UC programs in related Classification of Instructional Programs (CIP) codes.⁸

According to CIP data, the following institutions from the UC and CSU systems offer programs related to [Laboratory Science Occupations](#) (Exhibit 1).

Exhibit 1: California UC and CSU Institutions with Related Programs by CIP Code (2022)⁹

CIP Code and Title
15.0507 Environmental/Environmental Engineering Technology/Technician
<ul style="list-style-type: none"> No CSU or UC
15.0508 Hazardous Materials Management and Waste Technology/Technician
<ul style="list-style-type: none"> No CSU or UC

⁵ Lightcast. 2024.01; QCEW, Non-QCEW, Self-Employed.

⁶ 25th Percentile. Lightcast. 2024.01; QCEW, Non-QCEW, Self-Employed.

⁷ “AB-927 Public postsecondary education: community colleges: statewide baccalaureate degree.” California Legislative Information. Accessed 09/05/2023. leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927

⁸ CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data). The COE uses the national SOC-CIP crosswalk to determine which programs could potentially train for the occupation in question. nces.ed.gov/ipeds/cipcode/post3.aspx?y=56

⁹ Lightcast. Q1 2024 Data Set. Program Overview. Completions by Institutions. Completions data for 2020 and 2022 to account for programs not captured after decline in enrollment from the COVID-19 pandemic.

CIP Code and Title

[15.0903 Petroleum Technology/Technician](#)

- No CSU or UC

[26.0204 Molecular Biology](#)

- University of California-Irvine
- University of California-Los Angeles
- University of California-San Diego

[26.0406 Cell/Cellular and Molecular Biology](#)

- University of California-Berkeley
- University of California-Irvine
- University of California-Los Angeles
- University of California-Merced
- University of California-Riverside
- University of California-San Diego
- University of California-Santa Cruz

[26.0502 Microbiology, General](#)

- California State Polytechnic University-Pomona
- California State University-Chico
- California State University-Long Beach
- California State University-Los Angeles
- San Diego State University
- University of California-Berkeley
- University of California-Davis
- University of California-Riverside
- University of California-San Diego
- University of California-Santa Barbara

[26.0503 Medical Microbiology and Bacteriology](#)

- University of California-Davis
- University of California-Irvine

[26.0508 Microbiology and Immunology](#)

- University of California-Irvine

[26.1006 Environmental Toxicology](#)

- University of California-Berkeley
- University of California-Davis
- University of California-Irvine
- University of California-Riverside
- University of California-Santa Cruz

[41.0101 Biology/Biotechnology Technology/Technician](#)

- No CSU or UC

CIP Code and Title

[41.0301 Chemical Technology/Technician](#)

- No CSU or UC

[41.9999 Science Technologies/Technicians, Other](#)

- No CSU or UC

Existing Associate Degree Program(s)

AB-927 also states that districts should “continue to offer an associate degree program in the same academic subject for which a baccalaureate degree program has been approved.” To determine if an associate degree program in the same subject area exists, the COE reviewed the [California Community Colleges Chancellor’s Office’s official TOP-CIP crosswalk](#) and found that there are six TOP codes and 12 CIP codes related to [Laboratory Science Occupations](#) (Exhibit 2).

Exhibit 2: Chancellor’s Office TOP-CIP Crosswalk for Baccalaureate Degree Programs

TOP Code	TOP Title	CIP Code	CIP Title
0303.00	Environmental Technology	15.0507	Environmental/Environmental Engineering Technology/Technician
0303.00	Environmental Technology	15.0508	Hazardous Materials Management and Waste Technology/Technician
0954.30	Petroleum Technology	15.0903	Petroleum Technology/Technician
	No Match	26.0204	Molecular Biology
	No Match	26.0406	Cell/Cellular and Molecular Biology
0403.00	Microbiology	26.0502	Microbiology, General
	No Match	26.0503	Medical Microbiology and Bacteriology
	No Match	26.0508	Microbiology and Immunology
	No Match	26.1006	Environmental Toxicology
0430.00	Biotechnology and Biomedical Technology	41.0101	Biology/Biotechnology Technology/Technician
0955.00	Laboratory Science Technology		
0954.00	Chemical Technology	41.0301	Chemical Technology/Technician
0955.00	Laboratory Science Technology		
	No Match	41.9999	Science Technologies/Technicians, Other

According to the [Chancellor's Office Curriculum Inventory \(COCI\)](#), six regional community colleges offer an associate degree program for the CIP codes listed above (Exhibit 3).¹⁰

Exhibit 3: San Diego Community Colleges with Associate Degree Programs in Related CIP Codes

CIP Code	CIP Title	Community College(s) with Existing Program in CIP Code
15.0507	Environmental/Environmental Engineering Technology/Technician	<ul style="list-style-type: none"> • Cuyamaca • Southwestern
15.0508	Hazardous Materials Management and Waste Technology/Technician	<ul style="list-style-type: none"> • Cuyamaca • Southwestern
15.0903	Petroleum Technology/Technician	<ul style="list-style-type: none"> • None
26.0204	Molecular Biology	<ul style="list-style-type: none"> • None
26.0406	Cell/Cellular and Molecular Biology	<ul style="list-style-type: none"> • None
26.0502	Microbiology, General	<ul style="list-style-type: none"> • None
26.0503	Medical Microbiology and Bacteriology	<ul style="list-style-type: none"> • None
26.0508	Microbiology and Immunology	<ul style="list-style-type: none"> • None
26.1006	Environmental Toxicology	<ul style="list-style-type: none"> • None
41.0101	Biology/Biotechnology Technology/Technician	<ul style="list-style-type: none"> • MiraCosta • San Diego City • San Diego Mesa • San Diego Miramar • Southwestern
41.0301	Chemical Technology/Technician	<ul style="list-style-type: none"> • Southwestern
41.9999	Science Technologies/Technicians, Other	<ul style="list-style-type: none"> • None

WORKFORCE NEEDS ASSESSMENT: SUPPLY VS. DEMAND

According to AB-927, community colleges must identify and document unmet workforce needs “in the local community or region of the district.” To assess the regional workforce need for [Laboratory Science Occupations](#), this section compares educational supply with labor market demand.

¹⁰ “Programs. California Community Colleges Curriculum Inventory (COCI).” Accessed 09/05/2023. coci2.ccctechcenter.org/programs

Educational Supply

Baccalaureate educational supply for an occupation can be estimated by analyzing the number of completions¹¹ in related CIP codes. According to CIP data, the following institutions supply San Diego County with awards for Laboratory Science Occupations (Exhibit 4).

Exhibit 4: Number of Completions by Postsecondary Institutions (San Diego County, 2022)

CIP Code	CIP Title	Completions (2022)
26.0204	Molecular Biology	
	• University of California-San Diego	13
26.0406	Cell/Cellular and Molecular Biology	
	• University of California-San Diego	215
26.0502	Microbiology, General	
	• San Diego State University	25
	• University of California-San Diego	51
Total		304

Exhibit 5: Number of Completions by Postsecondary Institutions (California, 2022)

CIP Code	CIP Title	Completions (2022)
15.0507	Environmental/Environmental Engineering Technology/Technician	0
15.0508	Hazardous Materials Management and Waste Technology/Technician	109
15.0903	Petroleum Technology/Technician	0
26.0204	Molecular Biology	77
26.0406	Cell/Cellular and Molecular Biology	1,626
26.0502	Microbiology, General	404
26.0503	Medical Microbiology and Bacteriology	3
26.0508	Microbiology and Immunology	37
26.1006	Environmental Toxicology	48
41.0101	Biology/Biotechnology Technology/Technician	49
41.0301	Chemical Technology/Technician	27
41.9999	Science Technologies/Technicians, Other	0
Total		2,380

¹¹ Completion numbers include bachelor's degree programs or higher.

Labor Market Demand

Between 2023 and 2028, employers in San Diego County will need to hire 615 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement for [Laboratory Science Occupations](#) (Exhibit 6).

Exhibit 6: Labor Demand (Annual Job Openings) for Laboratory Science Occupations

SOC Code	Occupational Title	Average Annual Job Openings (2023-2028)	
		San Diego County	California
19-4021	Biological Technicians	401	1,649
19-4031	Chemical Technicians	133	950
19-4042	Environmental Science and Protection Technicians, Including Health	67	195
19-4043	Geological Technicians, Except Hydrologic Technicians	14	101
		615	2,895

Demand vs. Supply

Comparing labor market demand (annual job openings) with educational supply (bachelor's degree completions) suggests that there is a [supply gap](#) for [Laboratory Science Occupations](#) in San Diego County, with 615 annual openings and 304 awards. Comparatively, there are 2,985 annual openings in California and 2,380 awards, suggesting that there is also a [supply gap](#) across the state ¹² (Exhibit 7).

Exhibit 7: Labor Demand (Job Openings) vs. Educational Supply (Completions)¹³

	Demand (Job Openings)	Supply (Completions)	Supply Gap or Oversupply
San Diego	615	304	311
California	2,985	2,380	605

¹² "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/our-resources

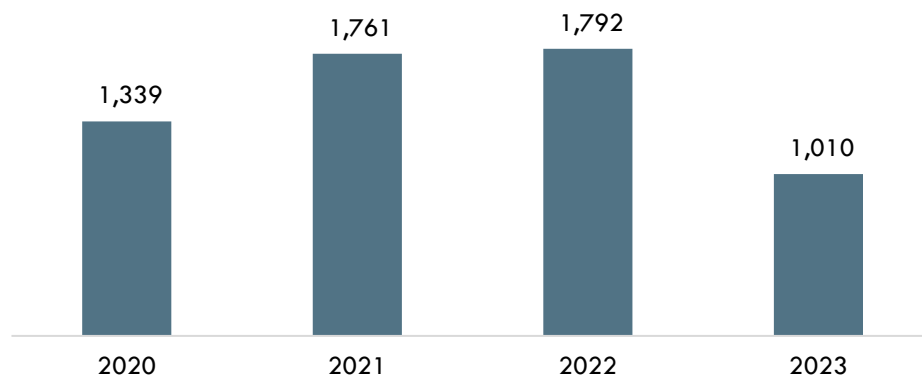
¹³ This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

OTHER LMI TO CONSIDER FOR PROGRAM DEVELOPMENT

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2020 and 2023, there was an average of 1,476 online job postings per year for *Laboratory Science Occupations* in San Diego County (Exhibit 8). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 6). While this brief includes online jobs postings data to help with curriculum development, the community colleges should note that this type of data is impacted by several variables: employers may post a position multiple times to increase the pool of applicants; a job posting can remain posted after a business decides not to fill a position; or an employer may use one posting to fill multiple positions, for example.

Exhibit 8: Number of Online Job Postings for Laboratory Science Occupations in San Diego County (2020-2023)¹⁴



¹⁴ Lightcast; "Job Posting Analytics." 2020-2023.

Top Employers

Between January 1, 2021 and December 31, 2023, the top five employers in San Diego County were University of California San Diego, Kelly Services, Gilead Sciences, BioLegend, and Takeda Pharmaceutical Company based on online job postings (Exhibit 9).

Exhibit 9: Top Employers for Laboratory Science Occupations in San Diego County¹⁵

Top Employers	
<ul style="list-style-type: none"> University of California San Diego Kelly Services Gilead Sciences BioLegend Takeda Pharmaceutical Company 	<ul style="list-style-type: none"> Aerotek Scripps Institution Of Oceanography Randstad Scripps Research Ctr PerkinElmer

Skills and Certifications

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2021 and December 31, 2023.

Exhibit 10: Top Skills for Laboratory Science Occupations in San Diego County¹⁶

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> Biology Molecular Biology Biochemical Assays Biochemistry Cell Cultures Cell Biology Chemistry Enzyme-Linked Immunosorbent Assay Laboratory Experience Data Analysis Laboratory Equipment Polymerase Chain Reaction Immunology Flow Cytometry Ribonucleic Acid Sequencing 	<ul style="list-style-type: none"> Research Communication Detail Oriented Troubleshooting Writing Self-Motivation Organizational Skills Operations Problem Solving Management Interpersonal Communications Verbal Communication Skills Multitasking Quality Control Presentations 	<ul style="list-style-type: none"> Microsoft Excel Microsoft PowerPoint Microsoft Word

¹⁵ Lightcast; "Job Posting Analytics." 2021-2023.

¹⁶ Lightcast; "Job Posting Analytics." 2021-2023.

Exhibit 11 lists the top certification that appeared in online job postings between January 1, 2021 and December 31, 2023.

Exhibit 11: Top Certification for Laboratory Science Occupations in San Diego County¹⁷

Top Certification in Online Job Postings

1. Valid Driver's License
 2. Security Clearance
 3. Hazardous Materials Certification - Technician Level
-

¹⁷ Lightcast; "Job Posting Analytics." 2021-2023.

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