










Laboratory Science Occupations

Labor Market Analysis: San Diego County

February 2024

Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED LEVEL OF EDUCATION
 Proceed with New Program	 	 	<input type="checkbox"/> Doctorate Degree <input type="checkbox"/> Master's Degree <input checked="" type="checkbox"/> Bachelor's Degree <input 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
SUPPORT FOR PROGRAM MODIFICATION?	NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING	NUMBER OF ANNUAL JOB OPENINGS	
 	MEDIUM 	MEDIUM 	

The San Diego & Imperial Center of Excellence (COE) developed this brief to assist the region’s community colleges with strategic planning and program development. *Laboratory Science Occupations* include “Biological Technicians,” “Chemical Technicians,” “Environmental Science and Protection Technicians, Including Health,” and “Geological Technicians, Except Hydrologic Technicians.” According to available data, *Laboratory Science Occupations* in San Diego County have a labor market demand of 615 annual job openings (while average demand for a single occupation in San Diego County is 289 annual job openings), and seven institutions supply 303 awards for these occupations, suggesting that there is a supply gap in the labor market. Entry-level wages are above the living wage for these occupations, and recent online job postings (2021-2023) show that average median earnings posted by employers are also above the living wage. This brief recommends proceeding with developing a new program because there is a supply gap in the region, and entry-level wages pay above the living wage.

Introduction

This report provides labor market information in San Diego County for the following occupational code in the Standard Occupational Classification (SOC)¹ system:

- **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.

For the purpose of this report, these occupations are referred to as *Laboratory Science Occupations*.

¹ 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).

Projected Occupational Demand

Between 2023 and 2028, employers in San Diego County will need to hire 219 workers annually to fill new jobs and backfill jobs in *Laboratory Science Occupations* due to attrition caused by turnover and retirement, for example (Exhibit 1). “Biological Technicians” are projected to have the most labor market demand between 2023 and 2028, with 401 annual job openings.

Exhibit 1: Number of Jobs for *Laboratory Science Occupations* (2023-2028)²

Occupational Title	2023 Jobs	2028 Jobs	2023 – 2028 Net Jobs Change	2023 - 2028 % Net Jobs Change	Annual Job Openings (Demand)
Biological Technicians	2,763	3,009	246	9%	401
Chemical Technicians	983	1,061	78	8%	133
Environmental Science and Protection Technicians, Including Health	582	615	33	6%	67
Geological Technicians, Except Hydrologic Technicians	114	122	8	7%	14
Total	4,442	4,807	365	8%	615

Earnings

According to traditional³ labor market information (LMI), entry-level hourly earnings for *Laboratory Science Occupations* range from \$18.91 to \$22.04 (Exhibit 2).

Exhibit 2: Hourly Earnings for *Laboratory Science Occupations* in San Diego County⁴

Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Biological Technicians	\$22.04	\$27.13	\$31.77
Geological Technicians, Except Hydrologic Technicians	\$21.19	\$25.98	\$34.27
Chemical Technicians	\$20.48	\$24.54	\$29.41
Environmental Science and Protection Technicians, Including Health	\$18.91	\$25.12	\$36.03

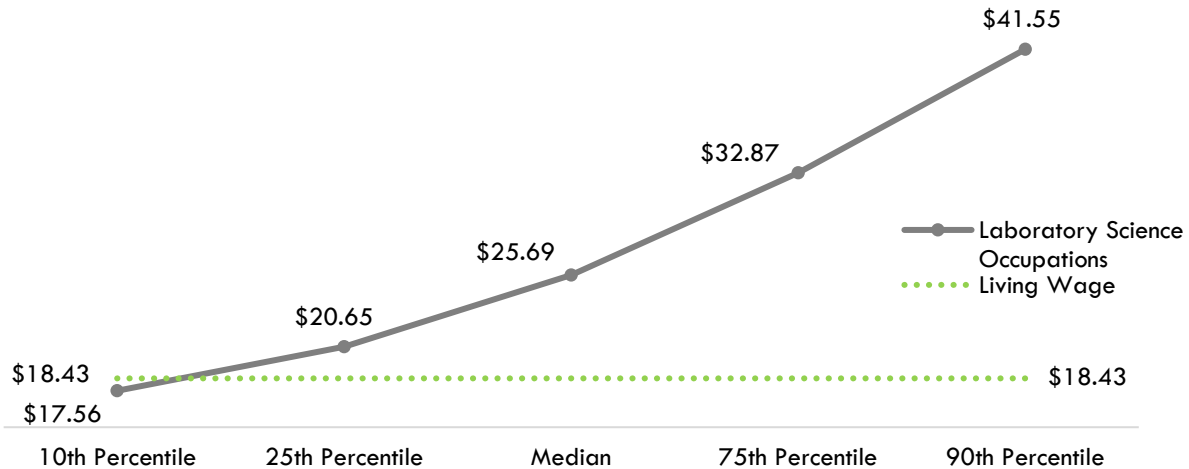
² Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

³ Traditional LMI is generally historical data captured by the U.S. Bureau of Labor Statistics (BLS) or the California Employment Development Department (EDD). It does not account for recent technological, economic, or legislative changes that may affect labor market demand and wages.

⁴ Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

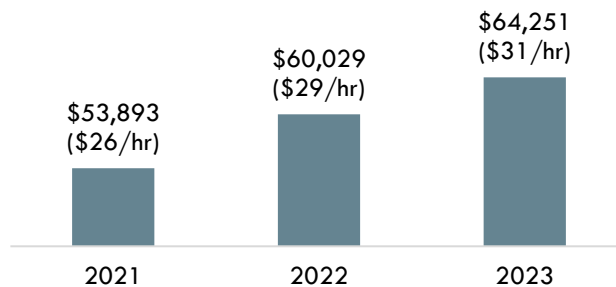
On average, the entry-level hourly earnings are \$20.65—or \$42,952 annual salary⁵; this is more than the living wage for a single adult in San Diego County, which is \$18.43 per hour (Exhibit 3).⁶

Exhibit 3: Hourly Earnings⁷ for Laboratory Science Occupations in San Diego County⁸



Between January 1, 2021 and December 30, 2023, employers advertised between \$26 to \$31 per hour in online job postings for *Laboratory Science Occupations* in San Diego County (Exhibit 4).⁹ This suggests that employers in recent years are increasing wages due to labor market forces that may not be captured by traditional LMI.

Exhibit 4: Median Advertised Salaries in Online Job Postings for Laboratory Science Occupations in San Diego County (2021-2023)



⁵ Annualized salaries assume a full-time position with 2,080 hours. Multiplying the hourly wage with 2,080 yields the annual salary.
⁶ "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2022. insightcced.org/family-needs-calculator.
⁷ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.
⁸ Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.
⁹ Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

Expected Level of Education

According to traditional LMI, *Laboratory Science Occupations* have a national educational attainment of an associate degree to a bachelor's degree.¹⁰ (Exhibit 5).

Exhibit 5: National Educational Attainment for *Laboratory Science Occupations*¹¹

Occupational Title	Typical Entry-Level Education
Biological Technicians	Bachelor's degree
Chemical Technicians	Associate degree
Environmental Science and Protection Technicians, Including Health	Associate degree
Geological Technicians, Except Hydrologic Technicians	Associate degree

Online job postings between January 1, 2021 and December 31, 2023 in San Diego County had a bachelor's degree as the most requested educational requirement for *Laboratory Science Occupations*; however, employers also expected the following certifications (Exhibit 6).¹²

Exhibit 6: Top Certifications for *Laboratory Science Occupations* in San Diego County in Online Job Postings (2021-2023)¹³

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

¹⁰ Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

¹¹ Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

¹² Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

¹³ Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. There are **eight** TOP codes and **eight** CIP codes related to *Laboratory Science Occupations* (Exhibit 7).

Exhibit 7: Related TOP and CIP Codes for *Laboratory Science Occupations*¹⁴

TOP or CIP Code	TOP or CIP Program Title
TOP 0301.00	Environmental Science
TOP 0303.00	Environmental Technology
TOP 0403.00	MicroBiology
TOP 0430.00	Biotechnology and Biomedical Technology
TOP 0954.00	Chemical Technology
TOP 0954.30	Petroleum Technology
TOP 0955.00	Laboratory Science Technology
TOP 1920.00	Ocean Technology
CIP 15.0507	Environmental/Environmental Engineering Technology/Technician
CIP 15.0508	Hazardous Materials Management and Waste Technology/Technician
CIP 15.0903	Petroleum Technology/Technician
CIP 26.0502	Microbiology, General
CIP 26.0508	Microbiology and Immunology
CIP 41.0101	Biology/Biotechnology Technology/Technician
CIP 41.0301	Chemical Technology/Technician
CIP 41.9999	Science Technologies/Technicians, Other

According to TOP data, **five** community colleges supply the region with awards for these occupations: *Cuyamaca College, MiraCosta College, San Diego City College, San Diego Mesa College, San Diego Miramar College, and Southwestern College*. According to CIP data, **two** non-community-college institutions supply the region with awards: *San Diego State University and University of California-San Diego* (Exhibit 8).

¹⁴ This brief uses a conservative estimate of program supply and only calculates awards from the TOP code listed in Exhibit 7.

**Exhibit 8: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions
(Program Year 2019-20 Through Program Year 2021-22 Average)**

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY19-20 to PY21-22)	Other Institutions 2-Yr Annual Average Awards (PY19-20 to PY20-21)	Total Average Supply (PY19-20 to PY21-22)
0303.00	Environmental Technology	20	0	20
	Cuyamaca	18	0	
	• Associate Degree	15	0	
	• Certificate 16 < 30 units	3	0	
	Southwestern	2	0	
	• Associate Degree	1	0	
	• Certificate 16 < 30 units	1	0	
0430.00	Biotechnology and Biomedical Technology	205	0	205
	MiraCosta	113	0	
	• Bachelor's Degree	23	0	
	• Associate Degree	17	0	
	• Certificate 30 < 60 units	29	0	
	• Certificate 8 < 16 units	21	0	
	• Certificate 6 < 18 units	23	0	
	San Diego City	0	0	
	San Diego Mesa	0	0	
	San Diego Miramar	92	0	
	• Associate Degree	68	0	
	• Certificate 8 < 16 units	24	0	
	Southwestern	0	0	
26.0502	Microbiology, General	0	78	78
	San Diego State University	0	29	

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY19-20 to PY21-22)	Other Institutions 2-Yr Annual Average Awards (PY19-20 to PY20-21)	Total Average Supply (PY19-20 to PY21-22)
	• Master's degree	0	1	
	• Bachelor's Degree	0	28	
	University of California-San Diego	0	49	
	• Bachelor's Degree	0	49	
			Total	303

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply¹⁵ suggests that there is a **supply gap** for these occupations in San Diego County, with **615** annual openings and **303** awards. Comparatively, there are **3,452** annual openings in California and **1,076** awards, suggesting that there is a **supply gap** across the state¹⁶ (Exhibit 9).

Exhibit 9: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

	Demand (Annual Openings)	Supply (Annual Awards)	Supply Gap or Oversupply
San Diego	615	303	312
California	3,452	1,076	2,376

Please note: 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.

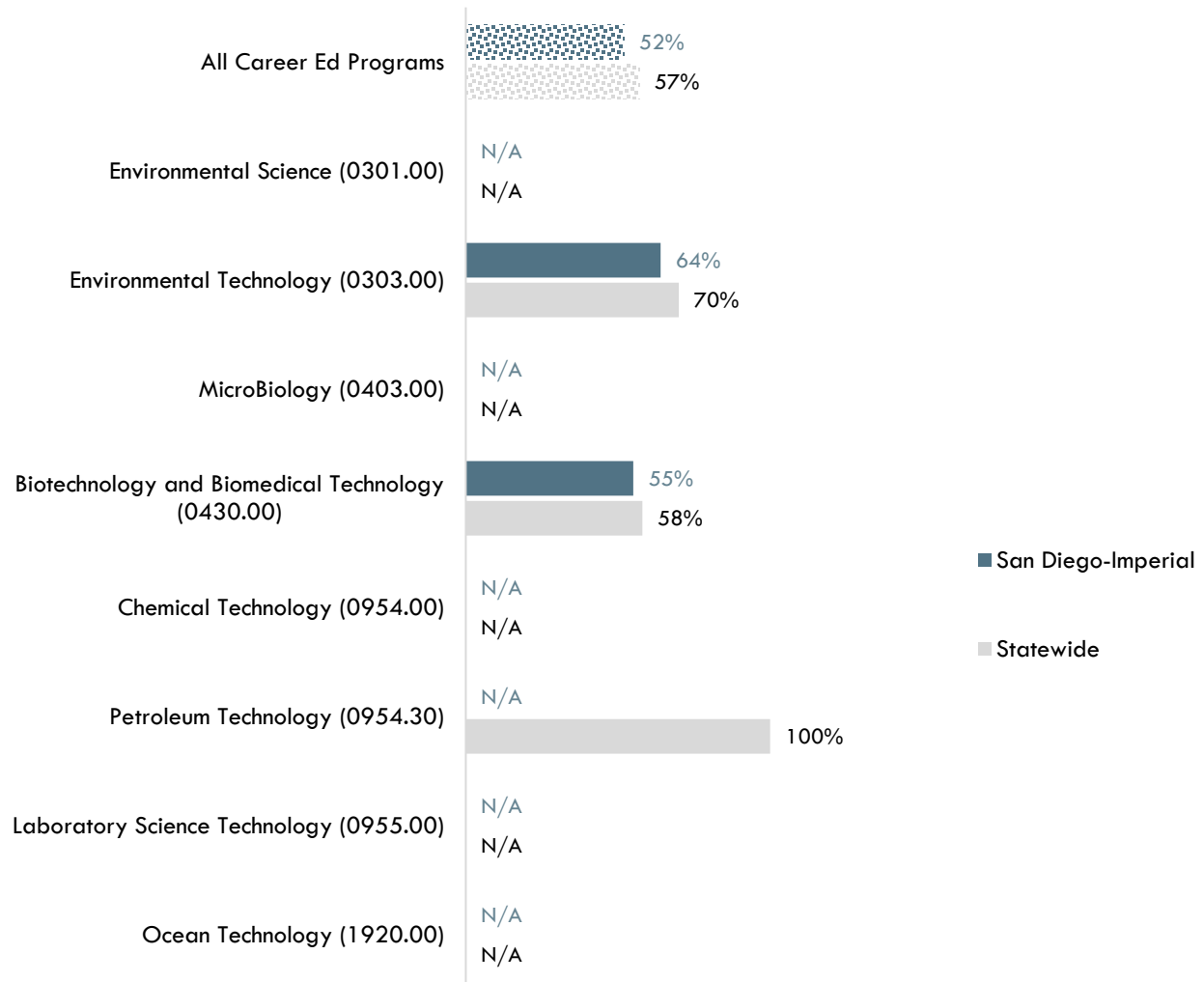
¹⁵ Labor supply can be found from two different sources: Lightcast or the California Community Colleges Chancellor's Office MIS Data Mart. Lightcast uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

¹⁶ "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/our-resources.

Student Outcomes and Regional Comparisons

According to the California Community Colleges LaunchBoard, 55 to 64 percent of students in the San Diego-Imperial region earned a living wage after completing a program related to *Laboratory Science Occupations*, compared 58 to 100 percent statewide and 57 percent of students in Career Education programs in general across the state (Exhibit 10).¹⁷

Exhibit 10: Percentage of Students Who Earned a Living Wage by Program, PY2020-21¹⁸

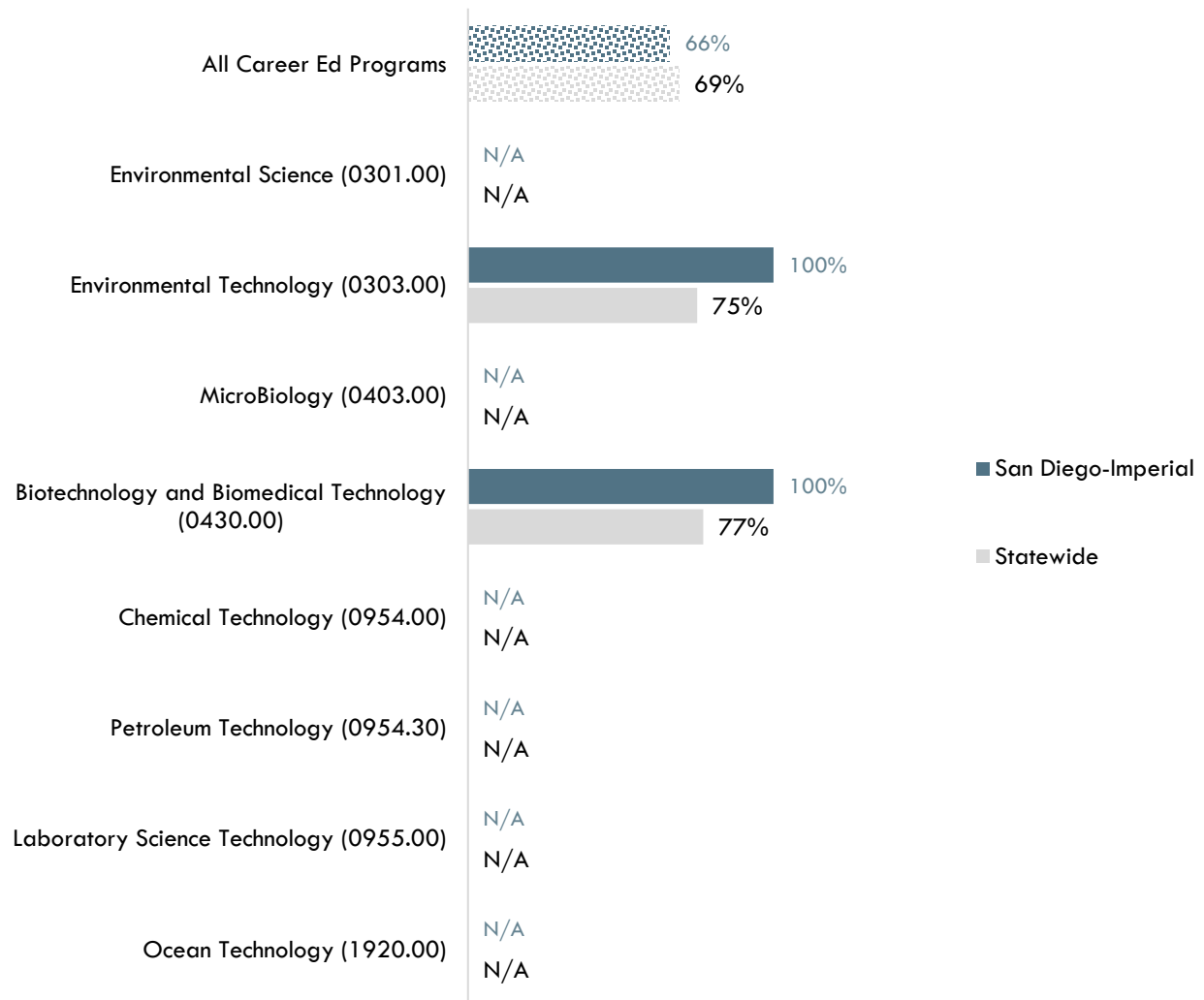


¹⁷ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹⁸ Most recent year with available data is Program Year 2020-21. Among completers and skills builders who exited, the percentage of students who attained a living wage.

According to the California Community Colleges LaunchBoard, 100 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a program related to *Laboratory Science Occupations*, compared to 75 to 77 percent statewide and 69 percent of students in Career Education programs in general across the state (Exhibit 11).¹⁹

Exhibit 11: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2019-20²⁰



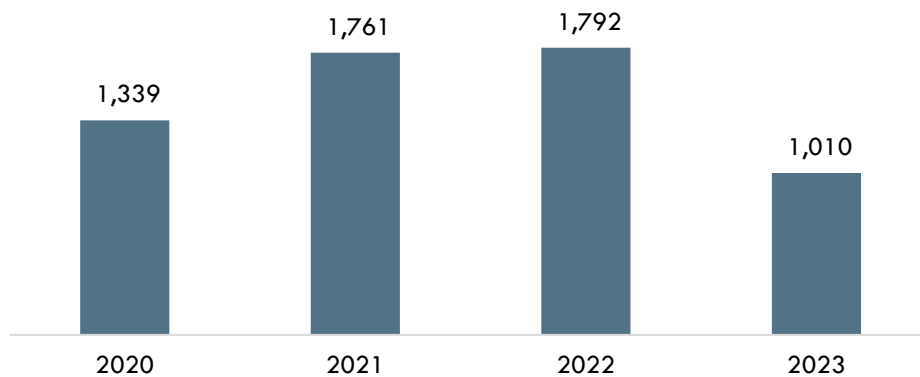
¹⁹ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

²⁰ Most recent year with available data is Program Year 2019-20. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

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 12). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1). 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 12: Number of Online Job Postings for *Laboratory Science Occupations* in San Diego County (2020-2023)²¹



²¹ Lightcast 2024.01; "Job Posting Analytics." 2020-2023.

Employers

Between January 1, 2021 and December 31, 2023, the top five employers in San Diego County for *Laboratory Science Occupations* were University of California San Diego, Kelly Services, Gilead Sciences, BioLegend, and Takeda Pharmaceutical Company based on online job postings (Exhibit 13).

Exhibit 13: Top Employers for *Laboratory Science Occupations* in San Diego County²²

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

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

Exhibit 14: Top Skills for *Laboratory Science Occupations* in San Diego County²³

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

²² Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

²³ Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

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Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.