August 2022

Labor Market Analysis

Research Laboratory Technology

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Prepared by the Central Valley/Mother Lode Center of Excellence

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COVID-19 Statement: This report includes employment projection data by Emsi. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

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Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for Research Laboratory Technology. Four occupations related to Research Laboratory Technology were identified for Bakersfield College:

- 19-1029, Biological Scientists, All Other
- 19-4021, Biological Technicians
- 19-4031, Chemical Technicians
- 51-9061, Inspectors, Testers, Sorters, Samplers, and Weighers

Key findings:

- **Occupational demand —** Nearly 4,400 workers were employed in jobs related to Research Laboratory Technology in 2020 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is inspectors, testers, sorters, samplers, and weighers with 3,348 workers, a projected growth rate of 5% over the next five years, and 467 annual openings.

- **Wages —** Biological scientists, all other earn the highest entry-level wage, $26.75/hour in the subregion.

- **Employers —** Employers with the most job postings in the subregion are Mobile Med Work Health Solutions, Foster Farms, and Lockheed Martin Corporation.

- **Occupational titles —** The most common occupational title in job postings in the subregion is Inspectors, Testers, Sorters, Samplers, and Weighers. The most common job title is Homebased Product Tester.

- **Skills and certifications —** The top baseline skill is communication skills, the top specialized skill is quality assurance and control, and the top software skill is Microsoft Excel. The most in-demand certification is security clearance.

- **Education —** A high school diploma or equivalent is typically required for inspectors, testers, sorters, samplers, and weighers. An associate degree is typically required for chemical technician. A bachelor's degree is typically required for biological technicians and biological scientists, all other.

- **Supply —** Analysis of postsecondary completions shows that on average 2 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 616 trained workers in the subregion and 999 workers in the region. The Center of Excellence recommends that Bakersfield College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Research Laboratory Technology workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Bakersfield College to provide labor market information for Research Laboratory Technology. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the SCV/SML subregion is $11.91/hour.[1] Analysis of the program and occupational data related to Research Laboratory Technology resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 19-1029, Biological Scientists, All Other
- 19-4021, Biological Technicians
- 19-4031, Chemical Technicians
- 51-9061, Inspectors, Testers, Sorters, Samplers, and Weighers

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O*NET OnLine are shown below. There was no O*Net data available for Biological Scientists, All Other.

Biological Technicians
Job Description: 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.
Knowledge: Biology, English Language, Mathematics, Computers and Electronics, Chemistry
Skills: Reading Comprehension, Critical Thinking, Active Listening, Science, Active Listening

Chemical Technicians
Job Description: 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.
Knowledge: Chemistry, English Language, Mathematics, Computers and Electronics
Skills: Science, Critical Thinking, Reading Comprehension, Active Listening, Monitoring

Inspectors, Testers, Sorters, Samplers, and Weighers
Job Description: Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.
Knowledge: Production and Processing, English Language, Customer and Personal Service, Mechanical, Mathematics
Skills: Quality Control Analysis, Critical Thinking, Writing, Active Listening, Judgement and Decision Making

Occupational Demand

The SCV/SML subregion employed 4,389 workers in Research Laboratory Technology occupations in 2020 (Exhibit 1). The largest occupation is inspectors, testers, sorters, samplers, and weighers with 3,348 workers. This occupation is projected to grow by 5% over the next five years and has the greatest number of projected annual openings, 467.

[1] The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/.

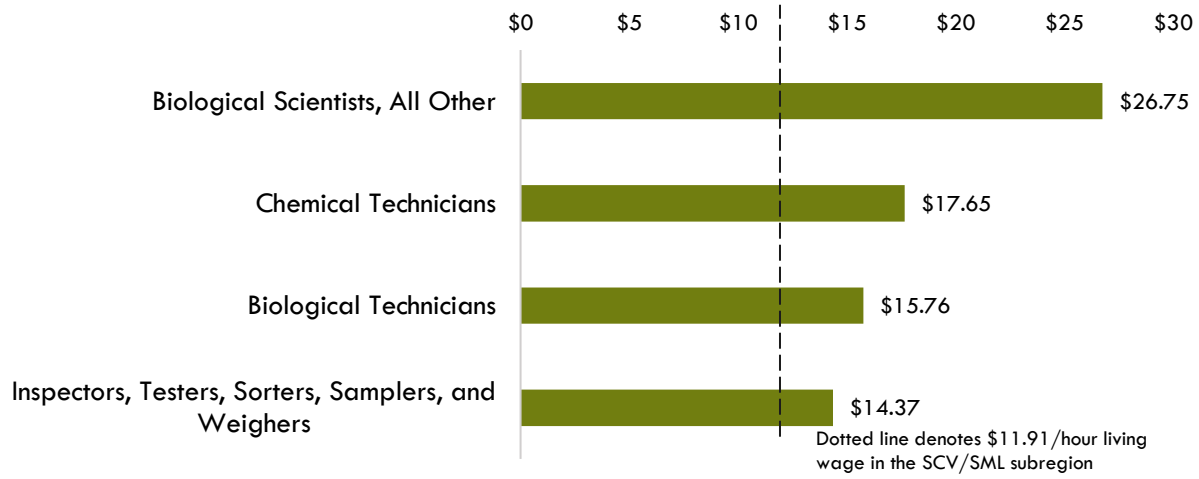
Exhibit 1. Research Laboratory Technology employment and occupational projections in the SCV/SML subregion

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Inspectors, Testers, Sorters, Samplers, and Weighers	3,348	3,510	162	5%	467
Biological Scientists, All Other	359	441	82	23%	56
Biological Technicians	372	391	19	5%	56
Chemical Technicians	310	319	8	3%	39
TOTAL	**4,389**	**4,661**	**272**	**6%**	**618**

Wages

Exhibit 2 shows the entry-level hourly wages of the Research Laboratory Technology occupations. Biological scientists, all other earn the highest entry-level wage, $26.75/hour in the subregion[2].

Exhibit 2. Research Laboratory Technology entry-level wages in the SCV/SML subregion



Job Postings

There were 498 job postings for the four occupations in the SCV/SML subregion from February 2022 to July 2022.[3] The employers with the most job postings are listed in Exhibit 3.

[2] Entry-level wages are derived from the 25th percentile.

[3] Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Exhibit 3. Top employers of Research Laboratory Technology by number of job postings

Employer	Job Postings	% Job Postings
Mobile Med Work Health Solutions	13	4%
Foster Farms	7	2%
Lockheed Martin Corporation	7	2%
Saputo	7	2%
Avantor	5	2%
Samplers	5	2%
Samplers Inc	5	2%
The Medicus Firm	5	2%
Dunn Edwards	4	1%
Ontrac	4	1%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across six O*NET OnLine occupations. The occupational title Inspectors, Testers, Sorters, Samplers, and Weighers is listed in 444 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Homebased Product Tester in 36 job postings, Quality Control in 23 job postings, and Sorter in 22 job postings.

Exhibit 4. Top occupational titles in job postings for Research Laboratory Technology

Occupational Title	Job Postings	% of Job Postings
Inspectors, Testers, Sorters, Samplers, and Weighers	444	89%
Chemical Technicians	25	5%
Biological Technicians	19	4%
Geneticists	6	1%
Molecular and Cellular Biologists	3	1%
Bioinformatics Scientists	1	0%

Salaries

Exhibit 5 shows the "Market Salaries" for Research Laboratory Technology occupations. These are calculated by Burning Glass using a machine learning model built off of millions of job postings every year. This accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 5. Salaries for Research Laboratory Technology occupations

Market Salary Percentile	Salary Amount
10th Percentile	$23,192
25th Percentile	$26,511
50th Percentile	$33,058
75th Percentile	$43,638
90th Percentile	$55,533

Education

Of the 498 job postings, 241 listed an education level preferred for the positions being filled. Among those, 67% requested high school or vocational training, 37% requested a bachelor's degree and 15% requested an associate degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

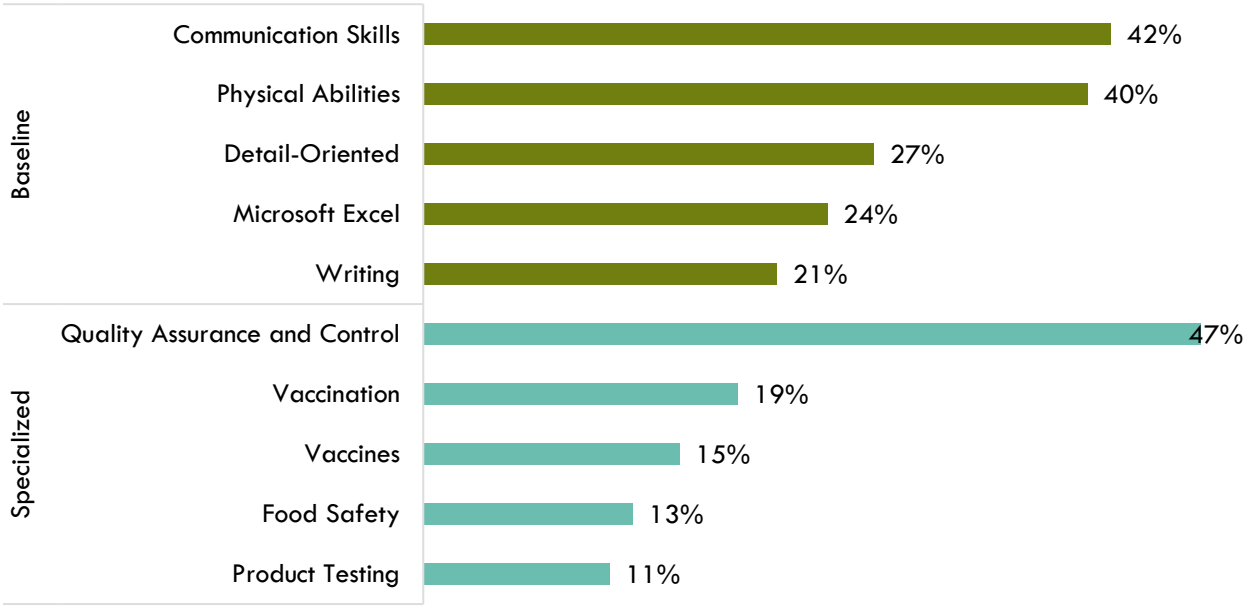
Exhibit 6. Education levels requested in job postings for Research Laboratory Technology

Education Level	Job Postings	% of Job Postings
High school or vocational training	161	67%
Bachelor's degree	89	37%
Associate's degree	35	15%
Master's degree	13	5%
Doctoral degree	5	2%

Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication skills, 42% of job postings, physical abilities, 40%, and detail-oriented, 27%. The top three specialized skills are quality assurance and control, 47% of job postings, vaccination, 19%, and vaccines, 15%.

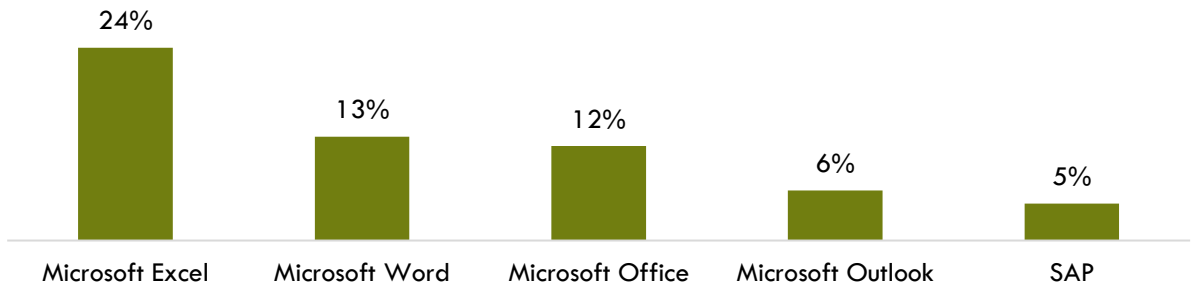
Exhibit 7. In-demand Research Laboratory Technology baseline and specialized skills



Software Skills

Analysis also included the software skills most in demand by employers. Microsoft Excel and Word were the top two software skills identified in job postings (Exhibit 8).

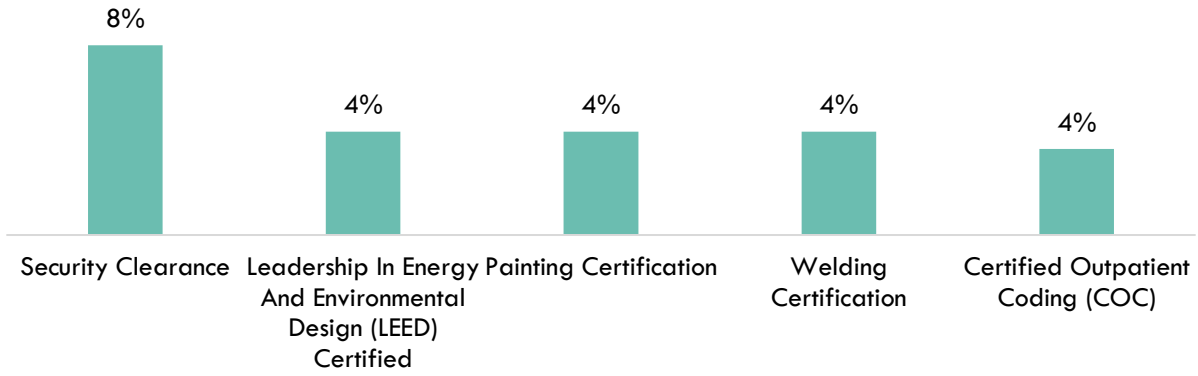
Exhibit 8. In-demand Research Laboratory Technology software skills



Certifications

Of the 498 job postings, 141 contained certification data. Among those, 8% indicated a need for security clearance. The next top certifications are Leadership In Energy And Environmental Design (LEED) Certified and painting certification (Exhibit 9). Please note 65% of job postings indicated a need for a driver's license even though it is not a certification.

Exhibit 9. Top Research Laboratory Technology certifications requested in job postings



Education, Work Experience & Training

A high school diploma or equivalent is typically required for inspectors, testers, sorters, samplers, and weighers. An associate degree is typically required for chemical technician. A bachelor's degree is typically required for biological technicians and biological scientists, all other (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for Research Laboratory Technology occupations[4]

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Inspectors, Testers, Sorters, Samplers, and Weighers	High school diploma or equivalent	None	Moderate-term	38.0%
Biological Scientists, All Other	Bachelor's degree	None	None	0.0%
Biological Technicians	Bachelor's degree	None	None	29.4%
Chemical Technicians	Associate's degree	None	Moderate-term	33.9%

Supply

Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP code and title: 095500 - Laboratory Science Technology. Analysis of the last three years of data shows that, on average, 2 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

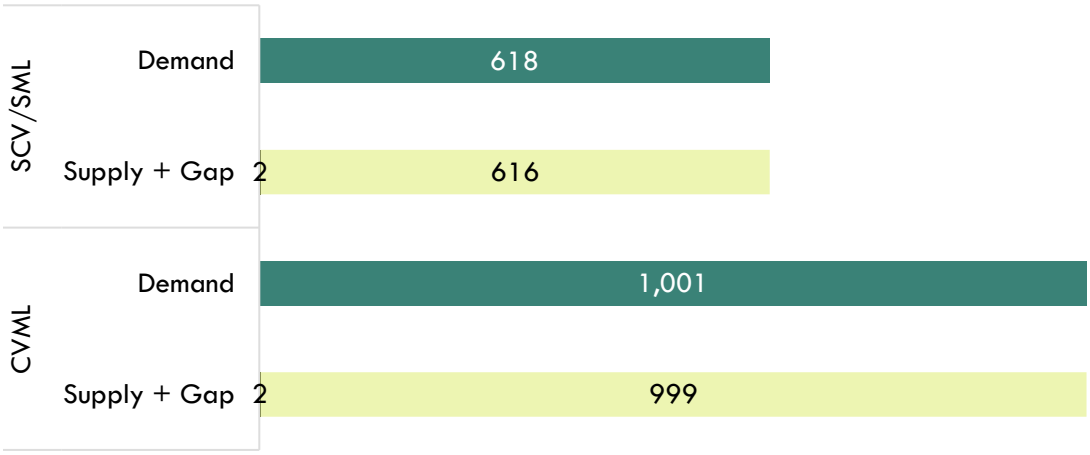
Exhibit 11. Postsecondary supply for Research Laboratory Technology occupations in the region

TOP/ CIP Code- Title	College	Certificate 16 < 30 semester units	Certificate 18 < 30 semester units	Subtotal
095500 - Laboratory Science Technology	Fresno City	0	2	2
TOTAL		**0**	**2**	**2**

[4] "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, https://www.bls.gov/cps/.

There is an undersupply of 616 Research Laboratory Technology workers in the SCV/SML subregion and 999 workers in the region (Exhibit 12).

Exhibit 12. Research Laboratory Technology workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the SCV/SML subregion and region



Student Outcomes

There is no employment and wage outcomes from the California Community College Chancellor's Cal-PASS Plus LaunchBoard data for the TOP code related to Research Laboratory Technology.

Conclusion

The entry-level wages of the four occupations exceed the SCV/SML subregion's average living wage. There were 498 job postings in the past six months for occupations related to Research Laboratory Technology in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication skills, and the top specialized skill is quality assurance and control.
- The top software skill is Microsoft Excel.
- The top certification is a security clearance.

There is an undersupply of trained workers, a shortage of 616 in the SCV/SML subregion and 999 in the region.

Recommendation

Based on these findings, it is recommended that Bakersfield College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Research Laboratory Technology workers in the region.

Appendix A: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry: economicmodeling.com.
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm.
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov.
Job Posting and Skills Data	Burning Glass: burning-glass.com/.
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org.

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.