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Labor Market Analysis

Analytical Chemistry Technician



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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 Lightcast. Lightcast’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 Analytical Chemistry Technician. Three occupations related to Analytical Chemistry Technician were identified for Modesto Junior College:

- 19-4031, Chemical Technicians
- 51-8091, Chemical Plant and System Operators
- 51-9011, Chemical Equipment Operators and Tenders

Key findings:

- **Occupational demand** — There were 449 workers employed in jobs related to Analytical Chemistry Technician in 2021 in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. The largest occupation is chemical technicians with 232 workers, a projected growth rate of 3% over the next five years, and 28 annual openings.
- **Wages** — Chemical plant and system operators earn the highest entry-level wage, \$19.63/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Merieux Nutrisciences, Tibco, and Danaher Corporation.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Chemical Technicians. The most common job title is Chemistry Technician.
- **Skills and certifications** — The top baseline skill is computer literacy, the top specialized skill is record keeping, and the top software skill is Apache Kafka. The most in-demand certification is a certified first responder.
- **Education** — A high school diploma or equivalent is typically required for chemical equipment operators and tenders and chemical plant and system operators. An associate degree is typically required for chemical technicians.
- **Supply** — There was available postsecondary completions data for the Central Valley/Mother Lode region for the TOP code: 095400-Chemical Technology.

Based on a comparison of occupational demand and supply, there is an undersupply of 60 trained workers in the subregion and 145 workers in the region. The Center of Excellence recommends that Modesto Junior College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Analytical Chemistry Technician workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Modesto Junior College to provide labor market information for Analytical Chemistry Technician. The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) 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 NCV/NML subregion is \$11.91/hour.¹ Analysis of the program and occupational data related to Analytical Chemistry Technician resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 19-4031, Chemical Technicians
- 51-8091, Chemical Plant and System Operators
- 51-9011, Chemical Equipment Operators and Tenders

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.

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

Chemical Plant and System Operators

Job Description: Control or operate entire chemical processes or system of machines.

Knowledge: Production and Processing, Chemistry, Mechanical, English Language, Public Safety and Security

Skills: Operations Monitoring, Operation and Control, Monitoring, Quality Control Analysis, Critical Thinking

Chemical Equipment Operators and Tenders

Job Description: Operate or tend equipment to control chemical changes or reactions in the processing of industrial or consumer products. Equipment used includes devulcanizers, steam-jacketed kettles, and reactor vessels.

Knowledge: Production and Processing, Chemistry, Mechanical, Computers and Electronics, English Language

Skills: Production and Processing, Chemistry, Mechanical, Computers and Electronics, English Language

Occupational Demand

The NCV/NML subregion employed 449 workers in Analytical Chemistry Technician occupations in 2021 (Exhibit 1). The largest occupation is chemical technicians with 232 workers in 2021. This occupation is projected to grow by 3% over the next five years and has the greatest number of projected annual openings, 28.

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://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Exhibit 1. Analytical Chemistry Technician employment and occupational projections in the NCV/NML subregion

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Chemical Technicians	232	239	8	3%	28
Chemical Equipment Operators and Tenders	183	215	32	17%	27
Chemical Plant and System Operators	34	43	9	26%	6
TOTAL	449	497	48	11%	60

Wages

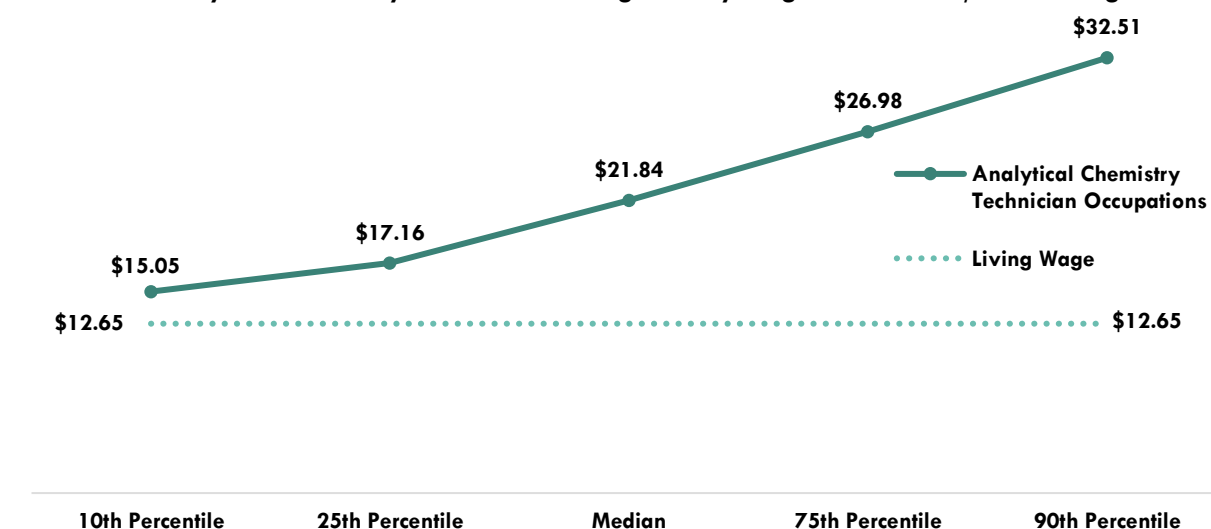
Exhibit 2a shows the hourly wages of the Analytical Chemistry Technician occupations. Chemical plant and system operators earn the highest entry-level wage, \$19.63/hour in the subregion². Please note 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, either by gained by long term employment, received extra training, etc.

Exhibit 2a. Analytical Chemistry Technician hourly wages in the NCV/NML subregion

Occupation	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings
Chemical Plant and System Operators	\$19.63	\$25.90	\$34.37
Chemical Technicians	\$17.33	\$21.05	\$23.41
Chemical Equipment Operators and Tenders	\$14.53	\$18.58	\$23.14

Exhibit 2b shows the average hourly wages for Analytical Chemistry Technician occupations, and the average entry-level wage exceeds the average living wage for the North Central Valley/Northern Mother Lode NCV/NML subregion.

Exhibit 2b. Analytical Chemistry Technician average hourly wages in the NCV/NML subregion



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

Job Postings

There were eight job postings for the three occupations in the NCV/NML subregion from March 2022 to September 2022.³ The employers with the most job postings are listed in Exhibit 3.

Exhibit 3. Top employers of Analytical Chemistry Technician by number of job postings

Employer	Job Postings	% Job Postings
Merieux Nutrisciences	2	29%
Tibco	2	29%
Danaher Corporation	1	14%
Kingspan Insulated Panels	1	14%
Nestle USA Incorporated	1	14%

Exhibit 4 shows how job postings for the targeted occupations in the NCV/NML subregion are distributed across two O*NET OnLine occupations. The occupational title Chemical Technicians is listed in six job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Chemistry Technician in two job postings, Member Technical Staff Messaging Team in two job postings, and Bead Release Testing Laboratory Testing Environment in one job posting.

Exhibit 4. Top occupational titles in job postings for Analytical Chemistry Technician

Occupational Title	Job Postings	% of Job Postings
Chemical Technicians	6	75%
Chemical Equipment Operators and Tenders	2	25%

Salaries

Exhibit 5 shows the “Market Salaries” for Analytical Chemistry Technician 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 Analytical Chemistry Technician occupations

Market Salary Percentile	Salary Amount
10th Percentile	\$29,897
25th Percentile	\$33,242
50th Percentile	\$35,226
75th Percentile	\$46,944
90th Percentile	\$52,947

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.

Education

Of the eight job postings, six listed an education level preferred for the positions being filled. Among those, 67% requested a bachelor's degree, 33% requested high school or vocational training, and 17% 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%.

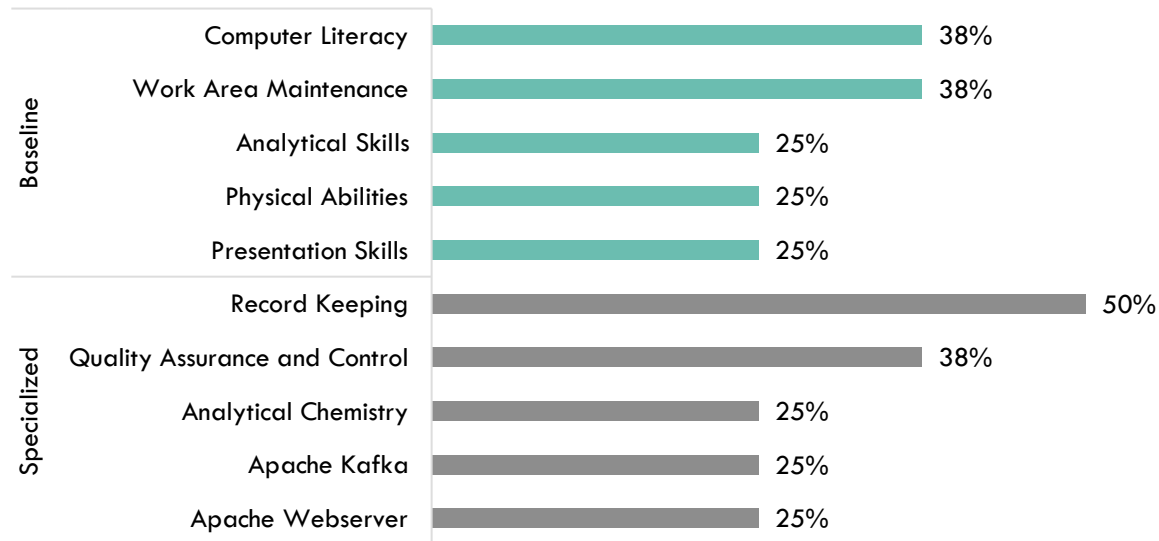
Exhibit 6. Education levels requested in job postings for Analytical Chemistry Technician

Education Level	Job Postings	% of Job Postings
Bachelor's degree	4	67%
High school or vocational training	2	33%
Associate's degree	1	17%

Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are computer literacy, 38% of job postings, work area maintenance, 38%, and analytical skills, 25%. The top three specialized skills are record keeping, 50% of job postings, quality assurance and control, 38%, and analytical chemistry, 25%.

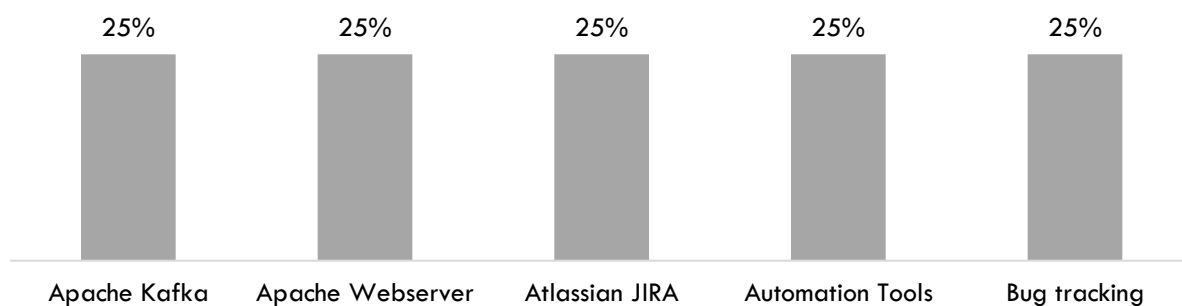
Exhibit 7. In-demand Analytical Chemistry Technician baseline and specialized skills



Software Skills

Analysis also included the software skills most in demand by employers. Apache Kafka and Apache Webserver were the top two software skills identified in job postings (Exhibit 8).

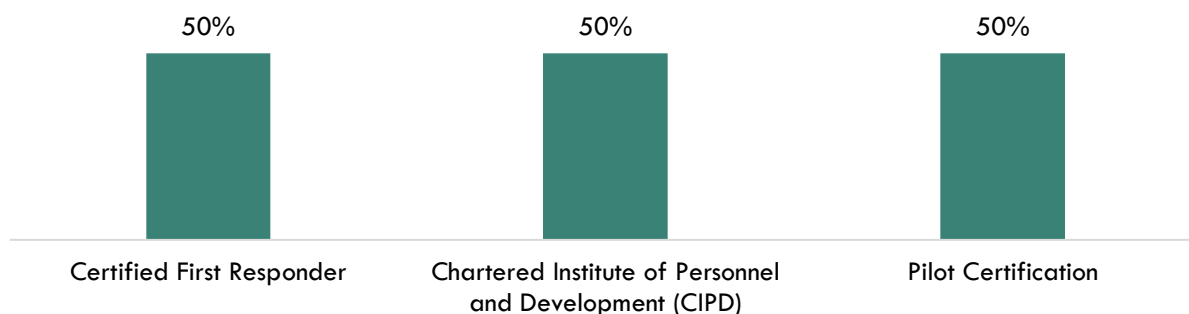
Exhibit 8. In-demand Analytical Chemistry Technician software skills



Certifications

Of the eight job postings, two contained certification data. Among those, 50% indicated a need for a certified first responder. The next top certifications are Chartered Institute of Personnel and Development (CIPD) and pilot certification (Exhibit 9).

Exhibit 9. Top Analytical Chemistry Technician certifications requested in job postings



Education, Work Experience & Training

A high school diploma or equivalent is typically required for chemical equipment operators and tenders and chemical plant and system operators. An associate degree is typically required for chemical technicians (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for Analytical Chemistry Technician occupations⁴

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Chemical Technicians	Associate's degree	None	Moderate-term	33.9%
Chemical Equipment Operators and Tenders	High school diploma or equivalent	None	Moderate-term	34.5%

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

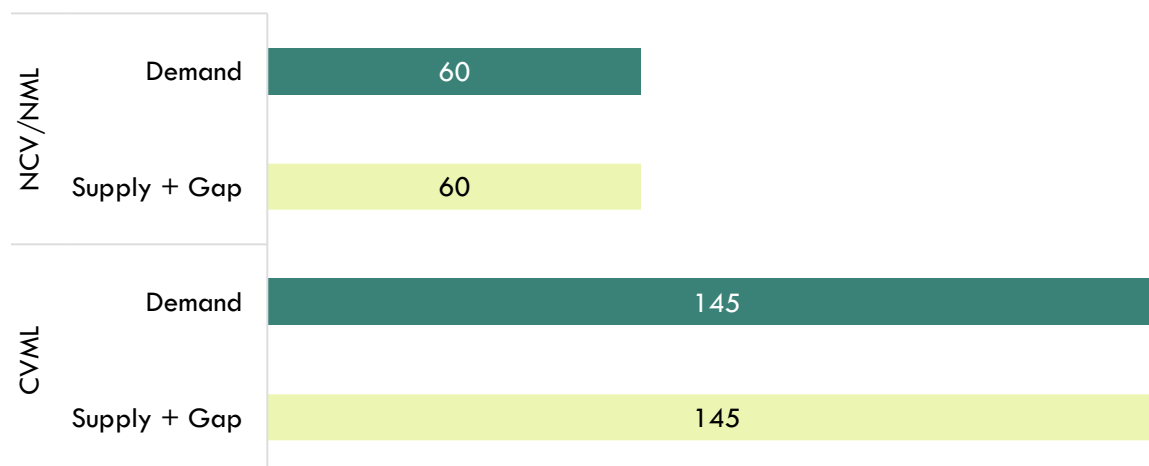
Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Chemical Plant and System Operators	High school diploma or equivalent	None	Moderate-term	45.9%

Supply

There was no program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP code and title: 095400- Chemical Technology.

There is an undersupply of 60 Analytical Chemistry Technician workers in the NCV/NML subregion and 145 workers in the region (Exhibit 11).

Exhibit 11. Analytical Chemistry Technician workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the NCV/NML subregion and region



Student Outcomes

There was no employment and wage data outcomes from the California Community College Chancellor's Cal-PASS Plus LaunchBoard for the TOP code related to Analytical Chemistry Technician.

Conclusion

The entry-level wages of the three occupations exceed the NCV/NML subregion's average living wage. There were eight job postings in the past six months for occupations related to Analytical Chemistry Technician in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is computer literacy, and the top specialized skill is record keeping.
- The top software skill is Apache Kafka.
- The top certification is a certified first responder.

There is an undersupply of trained workers, a shortage of 60 in the NCV/NML subregion and 145 in the region.

Recommendation

Based on these findings, it is recommended that Modesto Junior College work with the regional director, the college's advisory board, and local industry in the development of programs to address the shortage of Analytical Chemistry Technician 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. (Lightcast). Lightcast occupational employment data are based on final LIGHTCAST industry data and final Lightcast 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 Lightcast 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. (Lightcast) 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.