

LABOR MARKET ANALYSIS

FOR PROGRAM RECOMMENDATION



C·O·E

CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

MANUFACTURING TECHNOLOGY IN THE GREATER SACRAMENTO REGION

North (Greater Sacramento)
Center of Excellence

MAY 2023

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SUMMARY

The North (Greater Sacramento) of Excellence for Labor Market Research prepared this report to provide a labor market analysis of educational supply and occupational demand for middle-skilled careers in the North (Greater Sacramento) subregion. This report aims to determine if demand in the local labor market is unmet by the supply from existing community college programs and other postsecondary training providers.

This report primarily focuses on training that leads to jobs in middle-skilled occupations - jobs that typically require education beyond a high school diploma but less than a bachelor's degree - but may include higher-skilled occupations for training pathways that lead to a bachelor's degree. Lowered skilled occupations are rarely considered in this analysis due to the lessened barriers for entry-level work, such as no formal education and fewer on-the-job training requirements.

Key findings include:

- The Greater Sacramento subregion held 131 manufacturing technology jobs in 2021. These jobs are projected to increase by 30% over the next five years, adding 39 new jobs to the subregion by 2026.
- Over the next five years, manufacturing technology jobs are projected to have 22 annual openings in the Greater Sacramento subregion.
- Analysis of wage data shows that manufacturing technology occupations earn \$8 to \$15 above the single adult living wage of \$14.53 per hour.
- Awards data analysis shows that North (Greater Sacramento) community colleges conferred an average of 13 awards (certificates and associate degrees) in Manufacturing and Industrial Technology (TOP 0956.00) programs over the last three academic years.

Recommendations include:

- The North (Greater Sacramento) Center of Excellence recommends exercising caution in developing new programs in manufacturing technology. A new program may overwhelm the small gap between occupational demand (22 AJO) and educational supply (13 avg annual awards).
- The North(Greater Sacramento) Center of Excellence recommends that colleges with existing programs in manufacturing technology expand to meet local demand.

INTRODUCTION

The North (Greater Sacramento) Center of Excellence (COE) was asked to provide labor market information for a proposed program at a regional community college. This report focuses on the following Standard Occupational Classification (SOC) occupations and codes:

- These middle-skill occupations require more education and training beyond a high school diploma but usually less than a four-year degree:
 - Industrial Engineering Technologists and Technicians (17-3026)
 - Calibration Technologists and Technicians (17-3098)

A review of related programs revealed the following Taxonomy of Programs (TOP) title(s) and code(s) are appropriate for inclusion in this report:

- Manufacturing and Industrial Technology (0956.00)

The corresponding Classification of Instructional Program (CIP) title(s) and code(s) are:

- Manufacturing Engineering Technology/Technician (15.0613)

OCCUPATIONAL DEMAND

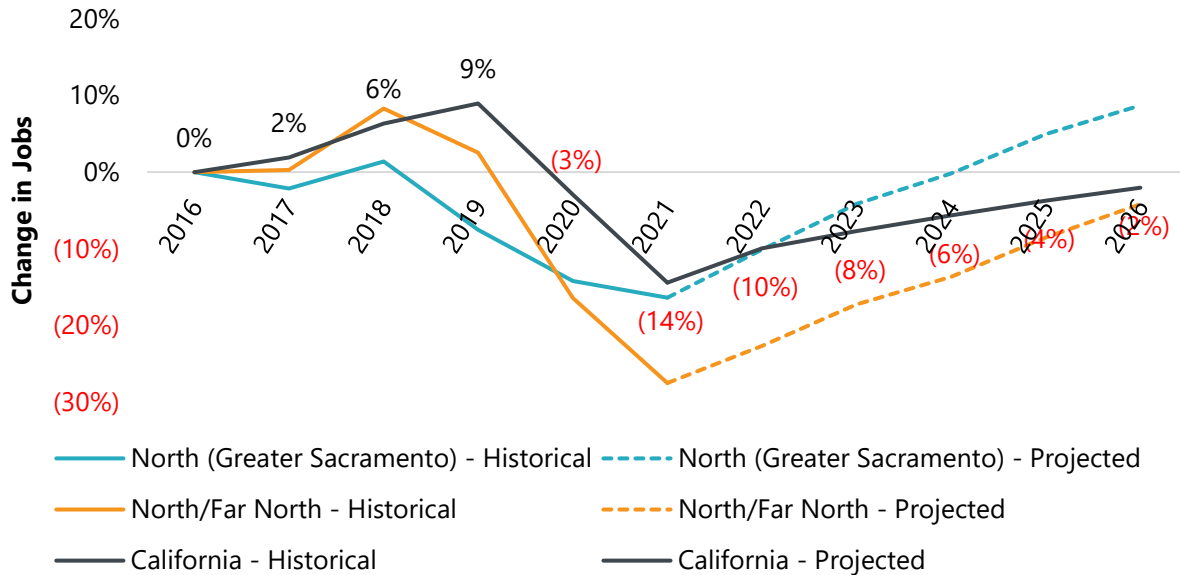
Exhibit 1 summarizes the five-year projected job growth for middle-skill and high-skill occupations in North (Greater Sacramento), North/Far North, and California.

Exhibit 1. Employment and projected demand, 2021-2026

Occupation	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	2021-2026 Annual Openings
Industrial Engineering Technologists and Technicians	91	121	30	33%	16
Calibration Technologists and Technicians	40	49	9	23%	6
North (Greater Sacramento)	131	170	39	30%	22
Industrial Engineering Technologists and Technicians	106	145	39	37%	20
Calibration Technologists and Technicians	41	49	8	20%	7
North/Far North	147	194	47	32%	27
Industrial Engineering Technologists and Technicians	3,228	3,727	499	15%	442
Calibration Technologists and Technicians	667	732	65	10%	83
California	3,895	4,459	564	14%	525

Exhibit 2 compares the percent change in jobs between 2016 through 2021 and the projected changes through 2026. The rate of change is indexed to the total number of jobs in 2016.

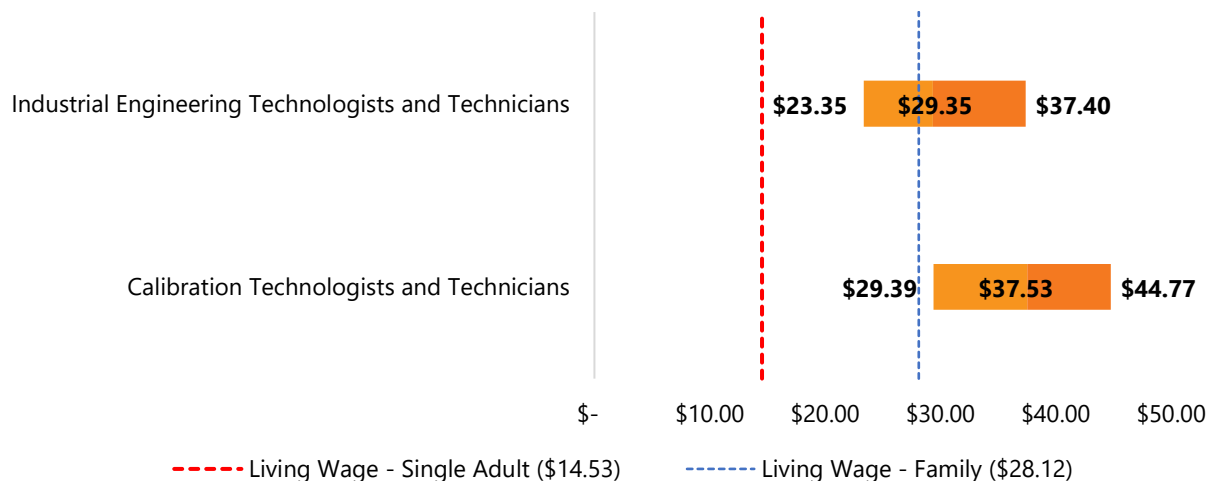
Exhibit 2. Changes in employment, 2016-2026



WAGES

Exhibit 3 compares the 25th percentile, median, and 75th percentile hourly wages for the selected occupations to the North (Greater Sacramento) living wage for a single adult (\$14.53 per hour) and a small family (\$28.12 per hour).^{1,2} The 25th and 75th percentile hourly wages are used to estimate entry-level and experienced worker wages.

Exhibit 3. Comparison of wages by occupation, 2021



¹ Living wage is defined as the level of income a single adult with no children must earn to meet basic needs, including food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs. Please note that the 25th-percentile and 75th-percentile hourly wages are used as proxy for entry-level and experienced-level wages.

² A small family is defined as a single adult and one school aged child (between the ages of 5 and 12 years).

JOB POSTINGS

This section analyzes recent data from online job postings (real-time LMI). Online job postings may provide additional insight into recent changes in the labor market that are not captured by historical trends.

The North COE identified 222 online job postings for the selected occupations in the seven-county Greater Sacramento subregion. Job posting data comes from Lightcast (formerly Emsi Burning Glass) and represents unique listings posted online within the last 12 months, from May 2022 through April 2023.

Exhibit 4 details the number of online job postings for the selected occupations.

Exhibit 4. Number of job postings by occupation

Occupation	Unique Job Postings	Share of Job Postings
Industrial Engineering Technologists and Technicians	222	100%
Calibration Technologists and Technicians	0	0%
Total Job Postings	222	100%

Exhibit 5 shows the top 10 relevant job titles with the most job postings.

Exhibit 5. Top jobs titles

Job Title	Number of Job Postings
Manufacturing Technicians	73
Production Technicians	28
Production Operations Technicians	16
Industrial Maintenance Technicians	14
Machine Shop Supervisors	7
Industrial Technicians	6
Platers	6
Production Shift Managers	5

Job Title	Number of Job Postings
Manufacturing Specialists	3
Industrial Engineering Technicians	3

Exhibit 6 shows the top 10 relevant employers with the most job postings for the selected occupations.

Exhibit 6. Employers with the most job postings

Employer	Number of Job Postings
Danaher	25
Harris & Bruno International	12
Broadridge Financial Solutions	10
Siemens	9
Teledyne Technologies	8
Agilent Technologies	6
Communications And Power Industries	6
Teledyne Flir	5
Jmax Properties	5
Teledyne Lecroy	5

Exhibit 7 shows the cities with the most job postings.

Exhibit 7. Job postings by City

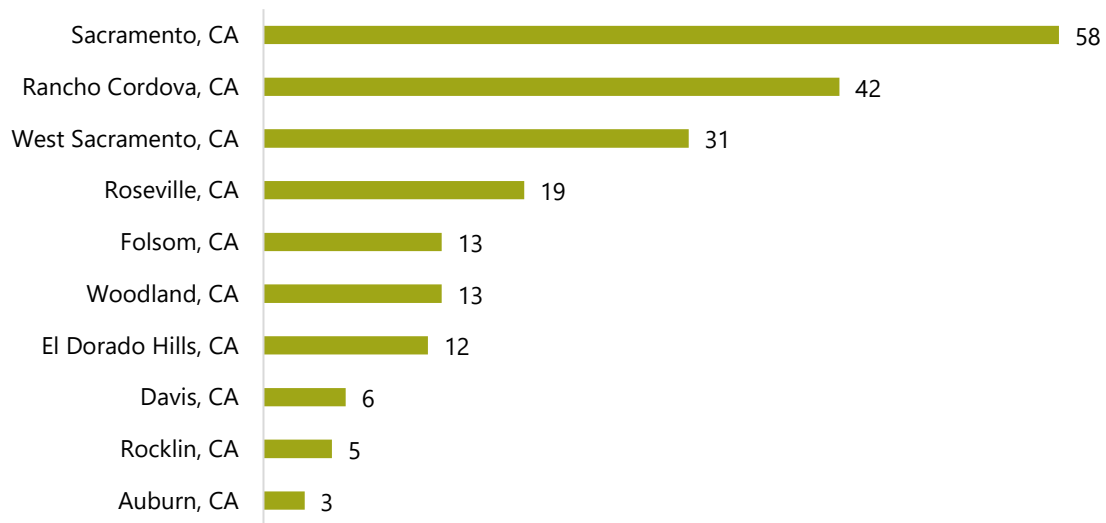


Exhibit 8 shows the top 10 skills across three categories for the studied occupations: specialized, essential, and software skills.³

Exhibit 8. Most in-demand skills

Specialized Skills	Common Skills	Software Skills
Tooling	Troubleshooting	Microsoft Office (Excel, Word, Outlook, PowerPoint)
Machinery	Operations	SAP Applications
Inventory Management	Communications	Microsoft Windows
Good Manufacturing Practices	Lifting Ability	Disassembler
Machining	Detail Oriented	Computer Aided Three-Dimensional Interactive Application (CATIA)
Electronics	Verbal Communication Skills	Inventory Control Systems
Oscilloscope	Microsoft Excel	PTC Creo (CAD Suite)

³ Specialized skills are those primarily required to perform specific tasks in an occupation. Essential skills are typically related to employability. These are skills that are prevalent across many occupations, and include both interpersonal attributes and learned skills (aka “soft skills”). Software skills are specific to any software tool or programming component used to support a job.

Specialized Skills	Common Skills	Software Skills
Spectrum Analyzer	Microsoft Outlook	SolidWorks (CAD)
Hand Tools	Computer Literacy	PTC Creo Parametric
Soldering	Problem-Solving	--

Exhibit 9 shows the minimum level of education requirements for related job postings in the Greater Sacramento subregion.⁴

Exhibit 9. Employer-preferred job candidate education levels

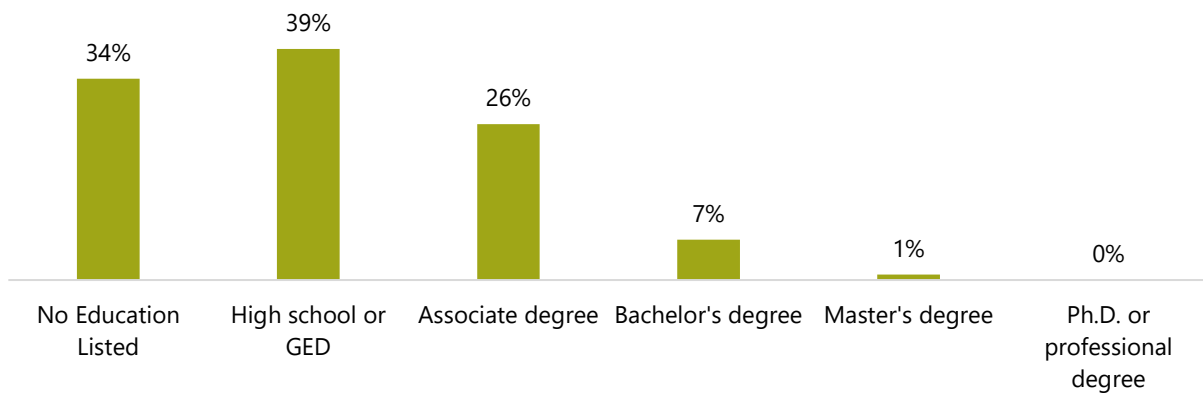
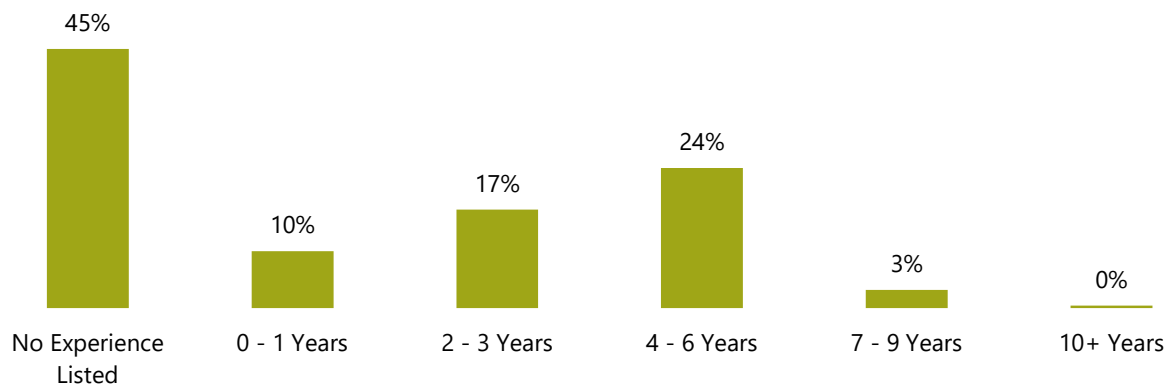


Exhibit 10 shows the experience levels employers require for job postings for the selected occupations.⁵

Exhibit 10. Employer-preferred job candidate experience levels



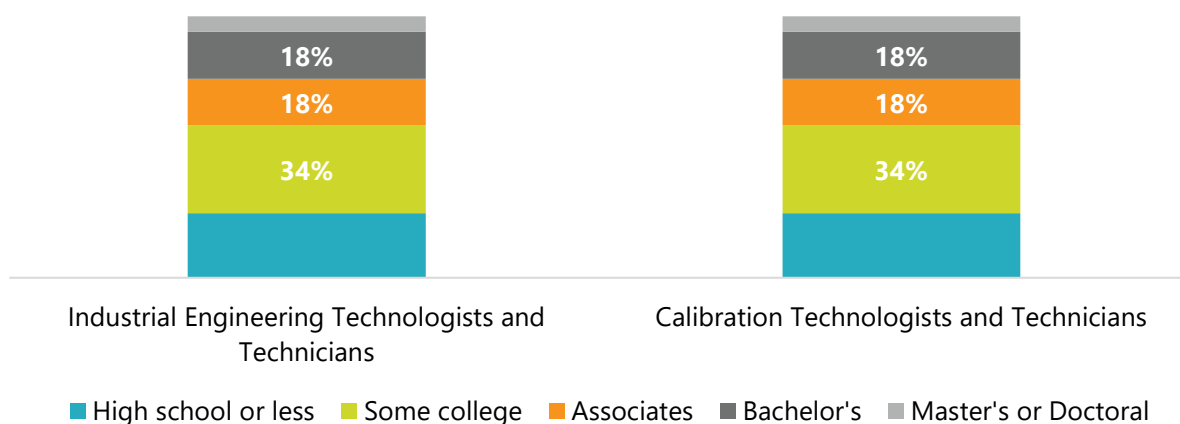
⁴ Employers may include more than one level of education as a hiring requirement in a job posting. As a result, the values in exhibit 9 may sum to greater than 100%.

⁵ Employers may include more than one level of experience as a hiring requirement in a job posting. As a result, the values in exhibit 10 may sum to greater than 100%.

EDUCATION AND TRAINING REQUIREMENTS

The U.S. Census Bureau collects data on the highest education level achieved by workers across all occupations. Exhibit 11 shows California's educational attainment of the current workforce in the selected occupations.

Exhibit 11. California educational attainment for selected occupations, 2019



The U.S. Bureau of Labor Statistics (BLS) uses a categorical system to assign typical entry-level education and job requirements to each occupation for which the BLS publishes projection data. These categories include entry-level education, work experience in a related occupation, and on-the-job training. Exhibit 12 shows the selected occupations' typical entry-level job requirements.

Exhibit 12. Typical entry-level job requirements

Occupation	Entry-level Education Requirements	Work Experience Requirements	On-The-Job Training Requirements
Industrial Engineering Technologists and Technicians	Associate degree	None	None
Calibration Technologists and Technicians	Associate degree	None	None

EDUCATIONAL SUPPLY

Educational supply for an occupation can be estimated by analyzing the number of awards issued in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. Exhibit 13 shows the TOP and CIP codes for educational programs related to the selected occupations.

Exhibit 13. TOP and CIP codes for training programs related to the selected occupations

TOP Programs and Codes	Aligned CIP Programs and Codes
Manufacturing and Industrial Technology (0956.00)	Manufacturing Engineering Technology/Technician (15.0613)

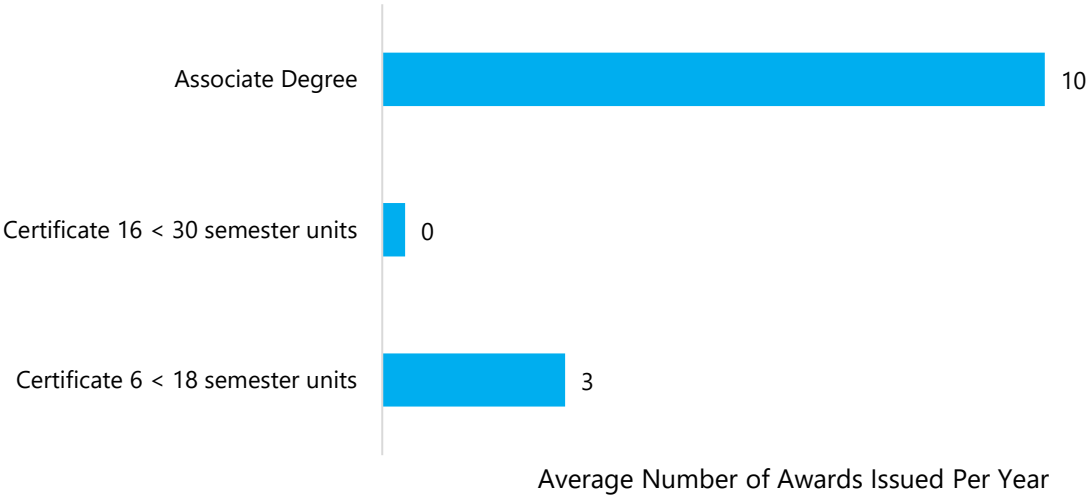
Community College Supply

Exhibits 14 and 15 compare the average number of certificates and degrees from selected Greater Sacramento community college programs over the last three academic years.

Exhibit 14. Annual average community college awards by program

Program - TOP Code	College	Annual Awards 2019-20	Annual Awards 2020-21	Annual Awards 2021-22	3-Yr Annual Awards Average
Manufacturing and Industrial Technology (0956.00)	Sierra	15	11	6	11
	Yuba	1	1	4	2
	Grand Total	16	12	10	13

Exhibit 15. Annual average community college awards by type, 2019-20 through 2021-22



Other Postsecondary Supply

No other postsecondary institutions offer programs under the CIP code Manufacturing Engineering Technology/Technician - 15.0613.

FINDINGS

- This report focuses on two occupations in the manufacturing technology career pathway: Industrial Engineering Technologists and Technicians (17-3026) and Calibration Technologists and Technicians (17-3098).
- The Greater Sacramento subregion held 131 manufacturing technology jobs in 2021. These jobs are projected to increase by 30% over the next five years, adding 39 new jobs to the subregion by 2026.
- Manufacturing technology jobs are projected to grow faster in the Greater Sacramento subregion than in California.
- Over the next five years, manufacturing technology jobs are projected to have 22 annual openings in the Greater Sacramento subregion.
- Analysis of wage data shows that manufacturing technology occupations earn \$8 to \$15 above the single adult living wage of \$14.53 per hour.
- There were 222 relevant online job postings for manufacturing technology occupations between May 2022 and April 2023. All job postings were for Industrial Engineering Technologists and Technicians.
- Approximately 52% of incumbent workers in manufacturing technology occupations have educational attainment levels consistent with community college offerings (some college or associate degrees). Another 18% of workers hold a bachelor's degree.
- Two Greater Sacramento community colleges offer degrees and certificates in programs related to manufacturing technology. These programs conferred an average of 13 awards (certificates and associate degrees) in Manufacturing and Industrial Technology (TOP 0956.00) programs over the last three academic years (2019-20 through 2021-22).

RECOMMENDATIONS

- Based on a comparison of annual openings to average annual awards in the Greater Sacramento subregion, there seems to be an undersupply of workers in manufacturing technology.
 - Community colleges and other postsecondary training providers issued an average of 13 awards over the last three years.
 - There are 22 projected annual openings for manufacturing technology jobs.
- The North (Greater Sacramento) Center of Excellence recommends exercising caution in developing new programs in manufacturing technology. A new program may overwhelm the small gap between occupational demand (22 AJO) and educational supply (13 avg annual awards).
- The North(Greater Sacramento) Center of Excellence recommends that colleges with existing programs in manufacturing technology expand to meet local demand.

New Program Recommendation		
Move forward with the new program	Proceed with caution	A new program is not recommended
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Program Modification	
Move forward with program modifications	Program modifications are not recommended
<input checked="" type="checkbox"/>	<input type="checkbox"/>

APPENDIX A. METHODOLOGY AND SOURCES

This report identified Occupations using the Center of Excellence TOP-to-CIP-to-SOC crosswalk and O*Net OnLine. This report's findings were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

Lightcast (Formerly EMSI/Burning Glass) 2023.1; QCEW Employees, Non-QCEW Employees, and Self-Employed. <https://www.economicmodeling.com/>. *Note: 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).*

Integrated Postsecondary Education Data System (IPEDS). National Center for Education Statistics. U.S. Department of Education. <https://nces.ed.gov/ipeds/>.

Labor Market Information Division. California Employment Development Department. <https://labormarketinfo.edd.ca.gov/>.

Management Information Systems (MIS) Data Mart. California Community Colleges Chancellor's Office. <https://datamart.cccco.edu/>.

O*NET OnLine. U.S. Department of Labor/Employment and Training Administration (DOL ETA). <https://www.onetonline.org/>.

Public Use Microdata Sample (PUMS). U.S. Census Bureau American Community Survey (ACS). <https://www.census.gov/programs-surveys/acs/microdata.html>

Self-Sufficiency Standard Tool for California. The University of Washington. <http://www.selfsufficiencystandard.org/>

"Taxonomy of Programs." California Community Colleges Chancellor's Office. June 2012, 6th Edition. <https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Educational-Services-and-Support/Academic-Affairs/What-we-do/Curriculum-and-Instruction-Unit/Files/TOPmanual6200909corrected12513pdf.ashx>

"TOP-CIP-SOC Crosswalk." Centers of Excellence for Labor Market Research. June 2021 Edition. <http://coecc.net/>

APPENDIX B. GLOSSARY OF KEY TERMS

Key Terms	Definition
Occupation	<p>Occupation refers to a category of similar jobs, careers, or professions regarding the work performed and the skills the workers possess. Workers who perform essentially the same tasks are in the same occupation, whether in the same industry. Some occupations are concentrated in a few industries, while others are found in many industries.</p> <p>Occupations differ from jobs in that jobs show the number of positions held in each occupation.</p>
Jobs	<p>A job is a specific instance of employment and includes any position where a worker provides labor for monetary compensation.</p> <p>Job numbers include employees (those who work for businesses) and proprietors (those who work for themselves). Full- and part-time jobs are included and counted equally (i.e., not adjusted to full-time equivalents). Data for jobs, or employment, are annual averages.</p>
Employment	<p>Employment refers to filled jobs, whether full- or part-time, temporary or permanent. The scope of "who" is counted as employed is noted in Appendix A. Methodology and Sources.</p>
Job Change	<p>Job change is the net increase or decrease of jobs over a given timeframe.</p>
Job Opening	<p>Job openings are the projected number of positions available for workers entering an occupation.</p> <p>Openings include growth and replacement job counts. Growth job counts are the positive change in the total number of workers employed. Replacement job counts are the estimates of new workers needed to replace workers permanently leaving the occupation.</p>
Percentile Wage (or wages)	<p>A percentile wage is the value of a wage at which a certain percentage of workers falls below. For example, a 25th percentile hourly wage of \$15.00 indicates that 25% of workers earn less than \$15.00, while 75% earn more. Percentile wages are specific to the geography shown in the report.</p> <p>The 25th-percentile and 75th-percentile hourly wages are used as a proxy for entry-level and experienced-level wages.</p>
Living Wage	<p>The living wage is the level of income a single adult with no children must earn to meet basic needs. The living wage is calculated using basic allowances for food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs. For additional information, please visit https://selfsufficiencystandard.org/</p>

Key Terms	Definition
Educational Attainment	Educational attainment is the highest level of education achieved by workers in an occupation. The data include workers aged 25 years and older.
Typical Entry-level Education	<p>The education level most workers need to gain employment in an occupation. Categories range from "no formal educational credential" and "high school diploma or equivalent" to "doctoral or professional degree." The types most relevant to community training are "some college, no degree," "postsecondary nondegree award," and "associate degree."</p> <p>The typical entry-level education may differ from the actual educational levels attained by workers employed in an occupation.</p>
Typical Work Experience	The relevant prior experience a worker needs to gain employment in an occupation. Categories include "5 years or more", "less than five years," and "none."
Typical On-The-Job (OTJ) Training	The level of on-the-job training a worker needs to obtain for competency in the skills required for an occupation. Categories include "none," "short-term (1 month or less)," "moderate-term (more than one month but less than 12 months)," "long-term (more than 12 months)," "apprenticeship," and "internship/residency."
Awards	Awards are the number of certificates and degrees conferred for a specific course of study each year. Awards count "papers" and, as a result, may be greater than the number of students who complete a program.

COVID-19 Statement: This report includes employment projection data produced by Lightcast (formerly EMSI). Employment projections are developed using models based on historical data, which in this set of projections covers the period through 2021. Most input data, therefore, precedes the pandemic. Employment projections are long-term projections intended to capture structural changes in the economy, not cyclical fluctuations. As such, projections data are not intended to capture the impacts of the recession that began in February 2020. Cyclical fluctuations, like recessions, impact projections when they become part of the historical data set.

Important Disclaimer: 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. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

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Centers of Excellence for Labor Market Research, Economic and
Workforce Development Program



CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

FOR MORE INFORMATION,
PLEASE CONTACT:

Ebony J. Benzing, Research
Manager

North (Greater Sacramento)
Center of Excellence

Ebony.Benzing@losrios.edu