

# Labor Market Analysis for Program Recommendation: 0934.70/ Electron Microscopy (Certificate of Achievement)

CVML Center of Excellence, September 2025



## Summary

|                         |  |  |   |
|-------------------------|--|--|---|
| Program LMI Endorsement | Endorsed: All LMI Criteria Met <input checked="" type="checkbox"/> | Endorsed: Some LMI Criteria Met <input type="checkbox"/> | Not LMI Endorsed <input type="checkbox"/> |
|-------------------------|--|--|---|

### Program LMI Endorsement Criteria

|             |  |                             |
|-------------|--|-----------------------------|
|             | Yes <input checked="" type="checkbox"/>  | No <input type="checkbox"/> |
| Supply Gap: | <i>Comments:</i> There are projected to be <b>17 annual job openings</b> throughout the NCV/NML subregion for <i>electron microscopy technician</i> -related occupations, which <b>are more than the 13 awards conferred by educational institutions in the NCV/NML subregion.</b> |                             |

|                                   |   |                             |
|-----------------------------------|---|-----------------------------|
|                                   | Yes <input checked="" type="checkbox"/>   | No <input type="checkbox"/> |
| Living Wage: (Entry-Level, 25th): | <i>Comments:</i> All four <i>electron microscopy technician</i> -related occupations included in this report have an entry-level hourly wage <b>above the NCV/NML living wage of \$16.81.</b> |                             |

|            |  |                             |
|------------|--|-----------------------------|
|            | Yes <input checked="" type="checkbox"/>  | No <input type="checkbox"/> |
| Education: | <i>Comments:</i> The typical entry-level education for <i>Electro-Mechanical and Mechatronics Technologists and Technicians, Calibration Technologists and Technicians</i> and <i>Engineering Technologists and Technicians, Except Drafters, All Other</i> is an associate degree and the typical entry-level education for <i>Precision Instrument and Equipment Repairers, All Other</i> is a high school diploma or equivalent. Additionally, <b>between 49% and 52% have completed some college or an associate degree as their highest level of education.</b> |                             |

### Emerging Occupations(s)

|                              |  |
|------------------------------|--|
| Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| Comments: N/A                |  |

The Central Valley/Mother Lode Center of Excellence for Labor Market Research (CVML COE) prepared this report to determine whether there is a supply gap in the North Central Valley/Northern Mother Lode regional labor market related to the following middle-skill occupations:

- Electro-Mechanical and Mechatronics Technologists and Technicians (SOC 17-3024)
- Calibration Technologists and Technicians (SOC 17-3028)
- Engineering Technologists and Technicians, Except Drafters, All Other (SOC 17-3029)
- Precision Instrument and Equipment Repairers, All Other (SOC 49-9069)

Middle-skill occupations typically require a community college education while above middle-skill occupations typically require at least a bachelor's degree.

Based on the available data, there appears to be a supply gap for *electron microscopy technician*-related occupations. In addition to these occupations having entry-level wages above the subregion's living wage, between 49% and 52% of workers have completed some college or an associate degree as their highest level of education. **Therefore, due to all of the regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for *electron microscopy technician*-related occupations.

**Exhibit 1: Labor Market Endorsement Summary**

| Occupation (SOC)  | Demand (Annual Openings)   | Supply (CC and Non-CC)    | Entry-Level Hourly Earnings (25th Percentile) | Typical Entry-Level Education     | Community College Educational Attainment |
|---|----------------------------|---------------------------|---|-----------------------------------|--|
| Electro-Mechanical and Mechatronics Technologists and Technicians (17-3024)     | NCV/NML: 2<br>SCV/SML: 2   | NCV/NML: 13<br>SCV/SML: 0 | NCV/NML: \$27.98<br>SCV/SML: \$28.31          | Associate's degree                | 49%                                      |
| Calibration Technologists and Technicians (17-3028)                             | NCV/NML: 2<br>SCV/SML: 4   |                           | NCV/NML: \$25.50<br>SCV/SML: \$25.80          | Associate's degree                | 49%                                      |
| Engineering Technologists and Technicians, Except Drafters, All Other (17-3029) | NCV/NML: 11<br>SCV/SML: 60 |                           | NCV/NML: \$29.43<br>SCV/SML: \$36.20          | Associate's degree                | 49%                                      |
| Precision Instrument and Equipment Repairers, All Other (49-9069)               | NCV/NML: 2<br>SCV/SML: 13  |                           | NCV/NML: \$22.31<br>SCV/SML: \$25.77          | High school diploma or equivalent | 52%                                      |
| <b>Total</b>  | <b>96</b>                  | <b>13</b>                 | -   | -                                 | -  |

**Demand:**

- The number of jobs related to the four *electron microscopy technician*-related occupations in this report are projected to increase 10% through 2029. There will be 17 annual job openings in the NCV/NML subregion.

- All four *electron microscopy technician*-related occupations have an entry-level hourly wage above the living wage of \$16.81 in the NCV/NML subregion.
- There were 212 online job postings for *electron microscopy technician*-related occupations over the past 12 months.
- The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for *Electro-Mechanical and Mechatronics Technologists and Technician, Calibration Technologists and Technicians* and *Engineering Technologists and Technicians, Except Drafters, All Other*, and a high school diploma or equivalent for *Precision Instrument and Equipment Repairers, All Other*.
- National-level educational attainment data indicates that between 49% and 52% of workers in the field have completed some college or an associate degree as their highest level of education.

## Supply:

- Between 2021 and 2024, there was an average of 13 awards conferred by community colleges in the NCV/NML subregion.
- Between 2020 and 2023, there were no non-community college institutions in the NCV/NML subregion that conferred awards in relevant programs.

## Demand

### Occupational Projections

Exhibit 2 shows the annual percent change in jobs for the four *electron microscopy technician*-related occupations from 2019 through 2029. The NCV/NML subregion experienced the highest growth in 2025 at 3%, compared to the 1% growth across all CA occupations. The percent change for the NCV/NML subregion experienced negative growth from 2019-2022 and again in 2024, and has been positive since then. From 2025 to 2029, growth is projected to remain steady (between 1% and 3%) in the NCV/NML subregion.

**Exhibit 2: Annual Percent Change in Jobs for Electron Microscopy Technician-Related Occupations, 2019-2029**

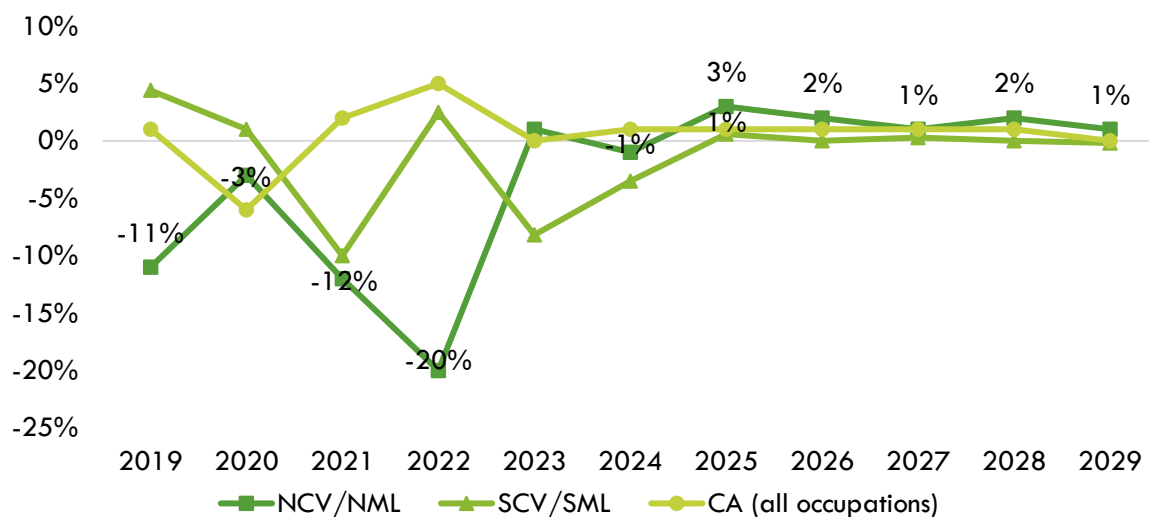


Exhibit 3 shows the five-year occupational demand projections for the four *electron microscopy technician*-related occupations. In the NCV/NML subregion, the number of jobs related to these occupations are

projected to increase by 10% through 2029. There are projected to be 17 jobs available annually in the NCV/NML subregion.

**Exhibit 3: Occupational Demand in NCV/NML, SCV/SML, and CVML<sup>1</sup>**

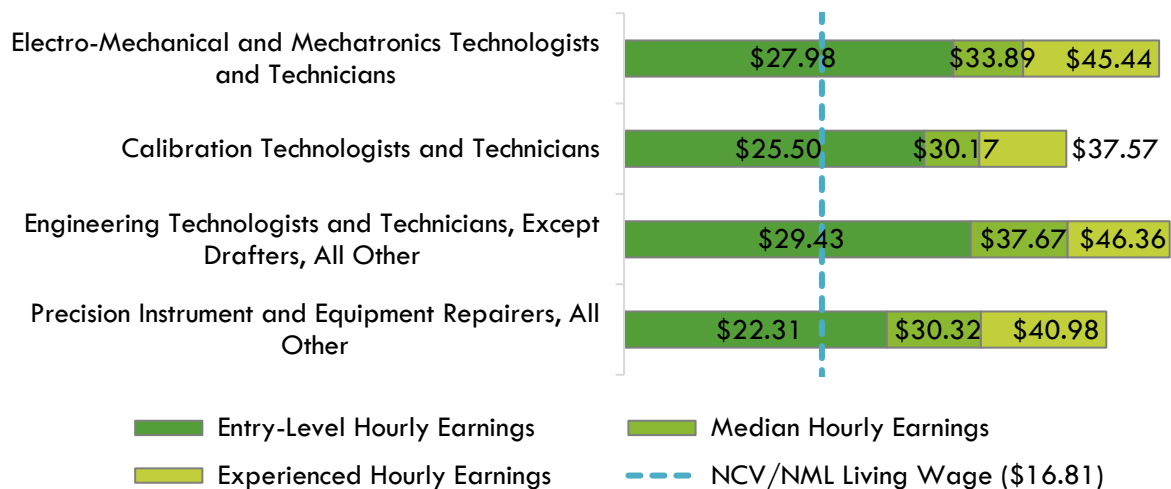
| Geography   | 2024 Jobs    | 2029 Jobs    | 2024-2029 Change | 2024-2029 % Change | Annual Openings |
|-------------|--------------|--------------|------------------|--------------------|-----------------|
| NCV/NML     | 148          | 162          | 15               | 10%                | 17              |
| SCV/SML     | 901          | 907          | 7                | 1%                 | 79              |
| <b>CVML</b> | <b>1,049</b> | <b>1,069</b> | <b>22</b>        | <b>2%</b>          | <b>96</b>       |

## Wages:

The labor market endorsement in this report considers the entry-level hourly wages for the four *electron microscopy technician*-related occupations as they relate to the subregions and region's living wage. NCV/NML, SCV/SML, and CVML wages are included below to provide a complete analysis of the region.

All four *electron microscopy technician*-related occupations have an entry-level hourly wage above the living wage for one adult in the NCV/NML subregion (\$16.81). The NCV/NML subregion average wage for these occupations is \$38.25, which is below the average statewide wage of \$41.02. Exhibit 4a shows the wage range for *electron microscopy technician*-related occupations and how they compare to the NCV/NML subregion's living wage.

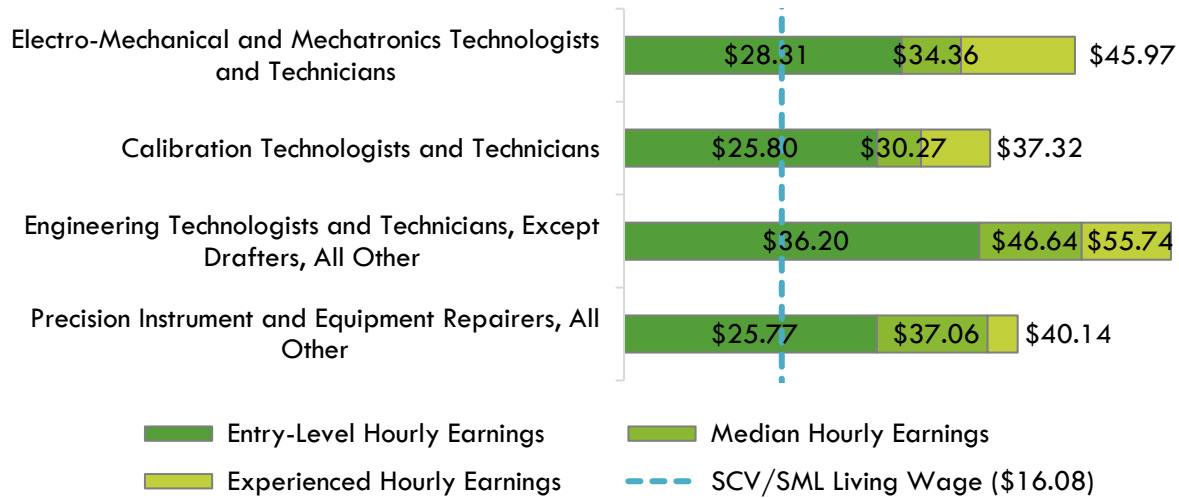
**Exhibit 4a: Wages by Occupation in NCV/NML**



All four *electron microscopy technician*-related occupations have an entry-level hourly wage above the living wage for one adult in the SCV/SML subregion (\$16.08). The SCV/SML subregion average wage for these occupations is \$44.13, which is above the average statewide wage of \$41.02. Exhibit 4b shows the wage range for *electron microscopy technician*-related occupations and how they compare to the SCV/SML subregion's living wage.

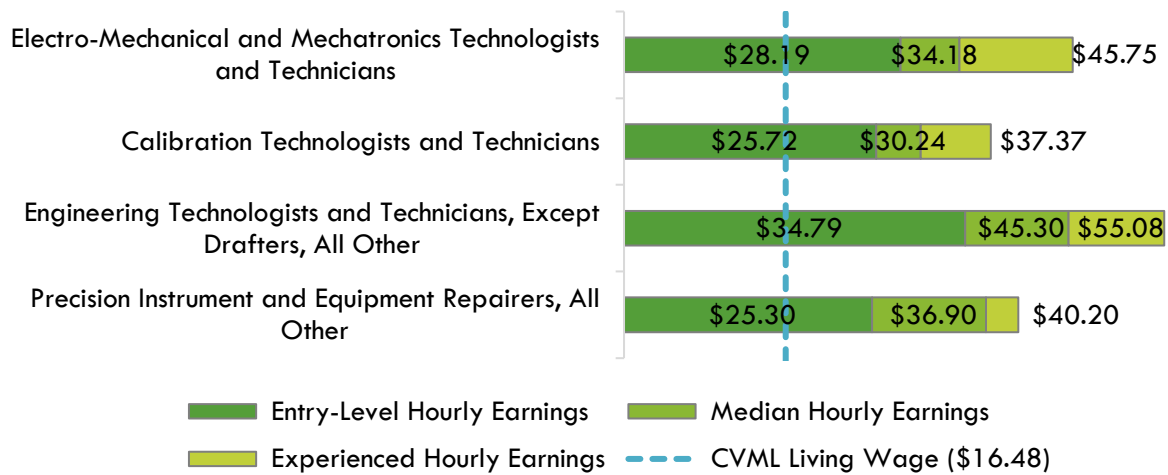
<sup>1</sup>Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

### Exhibit 4b: Wages by Occupation in SCV/SML



All four *electron microscopy technician*-related occupations have an entry-level hourly wage above the living wage for one adult in the CVML region (\$16.48). The CVML region average wage for these occupations is \$43.30, which is above the average statewide wage of \$41.02. Exhibit 5 shows the wage range for *electron microscopy technician*-related occupations and how they compare to the CVML region's living wage.

### Exhibit 5: Wages by Occupation in CVML



## Job Postings:

**Important Online Job Postings Data Note:** Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.<sup>2</sup> For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast's database.

Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

There were 212 online job postings related to *electron microscopy technician*-related occupations listed in the past 12 months (Exhibit 6).

**Exhibit 6: Number of Job Postings by Occupation (n=212)**

| Occupations   | Job Postings | Percentage of Job Postings |
|---|--------------|----------------------------|
| Precision Instrument and Equipment Repairers, All Other               | 141          | 67%                        |
| Electro-Mechanical and Mechatronics Technologists and Technicians     | 34           | 16%                        |
| Engineering Technologists and Technicians, Except Drafters, All Other | 29           | 14%                        |
| Calibration Technologists and Technicians                             | 8            | 4%                         |

The top employers in the region for *electron microscopy technician*-related occupations, by number of job postings, are shown in Exhibit 7.

**Exhibit 7: Top Employers by Number of Job Postings (n=212)**

| Employer            | Job Postings | Percentage of Job Postings |
|---------------------|--------------|----------------------------|
| Cushman & Wakefield | 10           | 5%                         |
| Stanislaus County   | 10           | 5%                         |
| The Home Depot      | 8            | 4%                         |

<sup>2</sup>K. R. Chowdhary, *Fundamentals of Artificial Intelligence* (Basingstoke: Springer Nature, 2020), <https://link.springer.com/book/10.1007/978-81-322-3972-7>

| Employer              | Job Postings | Percentage of Job Postings |
|-----------------------|--------------|----------------------------|
| Amazon                | 7            | 3%                         |
| Caltronics            | 7            | 3%                         |
| GXO Logistics         | 5            | 2%                         |
| Pacific Bay Equipment | 5            | 2%                         |
| Epic iO Technologies  | 4            | 2%                         |
| JLL                   | 4            | 2%                         |
| StandardAero          | 4            | 2%                         |

The top specialized, common, and software skills for *electron microscopy technician*-related occupations are listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 8.

### Exhibit 8: Top Skills by Number of Job Postings (n=212)

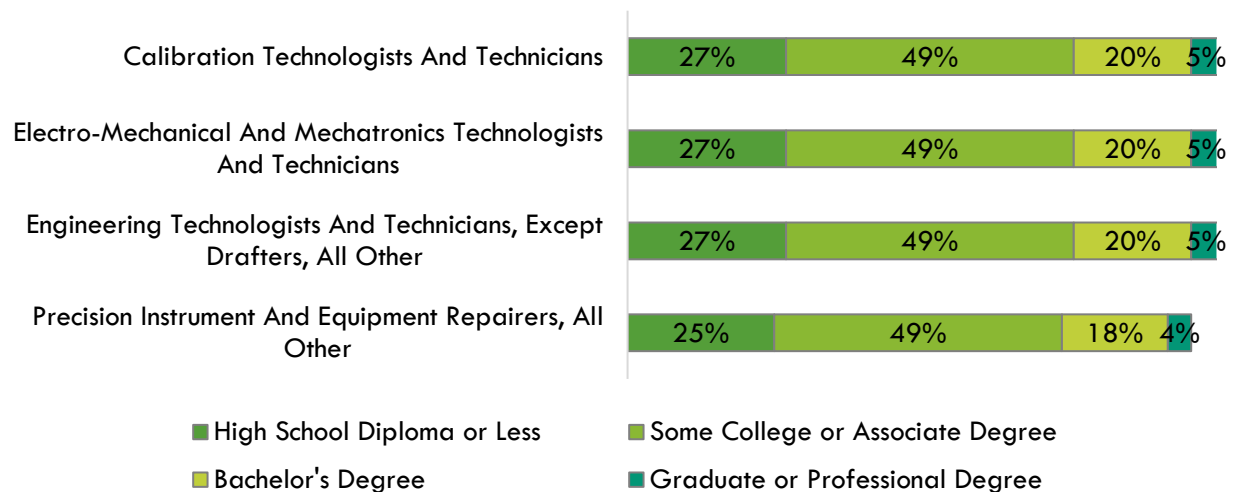
| Top Specialized Skills                           | Top Soft Skills                        | Top Computer Skills                |
|--|--|------------------------------------|
| Robotics (35)                                    | Communication (78)                     | Microsoft Office (20)              |
| Electronics (30)                                 | Troubleshooting (Problem Solving) (77) | Microsoft Excel (17)               |
| Preventive Maintenance (26)                      | Customer Service (59)                  | Microsoft Word (11)                |
| Mechatronics (22)                                | Good Driving Record (43)               | Microsoft Outlook (10)             |
| Safety Standards (22)                            | Lifting Ability (36)                   | Microsoft PowerPoint (9)           |
| Automation (21)                                  | Operations (35)                        | Spreadsheets (5)                   |
| Hand Tools (18)                                  | Writing (26)                           | R (Programming Language) (4)       |
| Safety Procedures (18)                           | Detail Oriented (26)                   | Inventory Control Systems (4)      |
| Computerized Maintenance Management Systems (18) | Problem Solving (25)                   | e-Builder (CPMS Software) (2)      |
| Project Management (17)                          | Time Management (23)                   | Geographic Information Systems (2) |

## Educational Attainment:

The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for *Electro-Mechanical and Mechatronics Technologists and Technicians, Calibration Technologists and Technicians* and *Engineering Technologists and Technicians, Except Drafters, All Other* and lists a high school diploma or equivalent as the typical entry-level education for *Precision Instrument and Equipment Repairers, All Other*. National-level educational attainment data indicates that between 49% and 52% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 9 shows the educational attainment for the four *electron microscopy technician*-related occupations.

Of the 212 online job postings, 45% (equivalent to 96 postings) of cumulative job postings for the four *electron microscopy technician*-related occupations listed a minimum education requirement in the NCV/NML subregion. Of the 96 postings, 84% (81) requested a high school or GED.

### Exhibit 9: National-level Educational Attainment for Electron Microscopy Technician-Related Occupations



# Educational Supply

## Community College Supply:

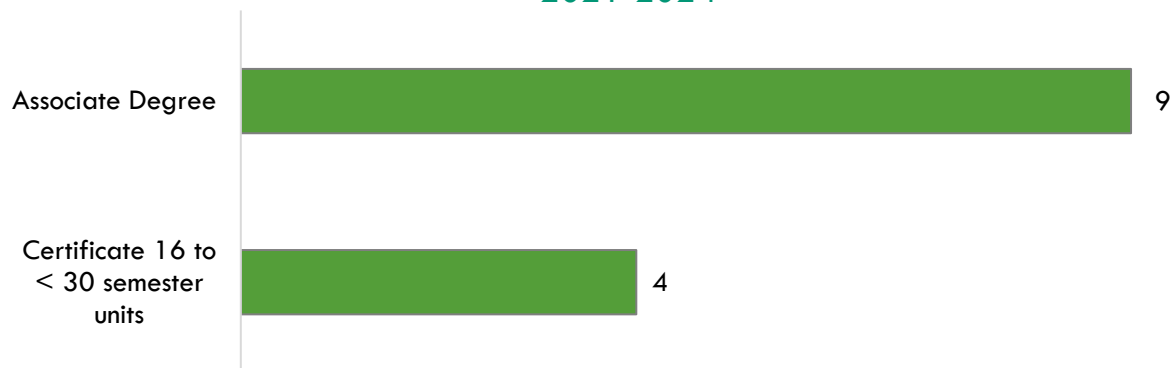
Exhibit 10 shows the annual and three-year average number of awards conferred by community colleges in the programs that have historically trained for the occupations included in this report. Only San Joaquin Delta conferred awards in the NCV/NML subregion. No awards were conferred by SCV/SML community colleges.

**Exhibit 10: NCV/NML Community College Awards (Certificates and Degrees) 2021-22 through 2023-24**

| TOP Code                          | Program             | College           | 2021-2022 Awards | 2022-2023 Awards | 2023-2024 Awards | 3-Year Award Average |
|-----------------------------------|---------------------|-------------------|------------------|------------------|------------------|----------------------|
| 0934.70                           | Electron Microscopy | San Joaquin Delta | 15               | 11               | 13               | 13                   |
| <b>Subtotal/Average</b>           |                     |                   | <b>15</b>        | <b>11</b>        | <b>13</b>        | <b>13</b>            |
| <b>NCV/NML Supply Grand Total</b> |                     |                   | <b>15</b>        | <b>11</b>        | <b>13</b>        | <b>13</b>            |

Exhibit 11 shows the annual average community college awards by type from 2021-22 through 2023-24. Of the 13 awards conferred in the NCV/NML subregion, 69% (9) of these awards were for an associate degree.

**Exhibit 11: Annual Average Community College Awards (NCV/NML) by Type, 2021-2024**



## Community College Student Outcomes:

Exhibit 12 shows the Strong Workforce Program (SWP) metrics for Electron Microscopy programs in San Joaquin Delta Community College District (SJDCCD), the NCV/NML subregion, the CVML region, and California.

Of the 80 electron microscopy program students statewide in the 2023-2024 academic year, 100% (80) attended a CVML Institution. SJDCCD students that exited electron microscopy programs in the 2021-2022 academic year had equal median annual earnings (\$83,460) compared to all electron microscopy students in the NCV/NML subregion (\$83,460), the CVML region (\$83,460) and statewide (\$83,460).

### Exhibit 12: Electron Microscopy (0934.70) Strong Workforce Program Metrics

| SWP Metric  | SJDCCD                | NCV/NML Subregion     | CVML Region           | California            |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| SWP Students  | 80                    | 80                    | 80                    | 80                    |
| SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year | 40%                   | 40%                   | 40%                   | 40%                   |
| SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course                | N/A                   | N/A                   | N/A                   | N/A                   |
| SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status | N/A                   | N/A                   | N/A                   | N/A                   |
| SWP Students Who Transferred to a Four-Year Postsecondary Institution                     | N/A                   | N/A                   | N/A                   | N/A                   |
| SWP Students with a Job Closely Related to Their Field of Study                           | N/A                   | N/A                   | N/A                   | N/A                   |
| Median Annual Earnings for SWP Exiting Students   | \$83,460<br>(\$40.12) | \$83,460<br>(\$40.12) | \$83,460<br>(\$40.12) | \$83,460<br>(\$40.12) |
| Median Change in Earnings for SWP Exiting Students  | N/A                   | N/A                   | N/A                   | N/A                   |
| SWP Exiting Students Who Attained the Living Wage   | N/A                   | N/A                   | N/A                   | N/A                   |



2023-2024



2022-2023



2021-2022



N/A

## Non-Community College Supply:

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for the occupations studied in this report. This includes examining the annual and three-year average number of awards conferred by non-community college institutions in programs that have historically trained for the occupations of interest.

Between 2020 and 2023, there were no non-community college institutions in the NCV/NML or SCV/SML subregions that conferred awards annually in related training programs.

## Appendix A: Methodology

The CVML COE prepared this report by analyzing data from occupations and education programs.

Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the CVML COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The CVML COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a "supply table" with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart ([datamart.cccco.edu](http://datamart.cccco.edu)) and CIP code data comes from the Integrated Postsecondary Education Data System ([nces.ed.gov/ipeds/use-the-data](http://nces.ed.gov/ipeds/use-the-data)), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the CVML COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; 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 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.

## Appendix B: Data Sources

| Data Type   | Source  |
|---|---|
| Occupational Projections, Wages, and Job Postings   | <p>Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see <a href="https://lightcast.io/">https://lightcast.io/</a></p>   |
| Living Wage   | <p>The living wage is derived from the Insight Center's California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, childcare, health care, transportation, and taxes. For more information, see: <a href="https://selfsufficiencystandard.org/California/">https://selfsufficiencystandard.org/California/</a></p> <p>Wage figures are used by the CCCCCO to calculate the percentage of students that attained the regional living wage.</p>   |
| Typical Education and Training Requirements, and Educational Attainment                       | <p>The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see <a href="https://www.bls.gov/emp/documentation/education/tech.htm">https://www.bls.gov/emp/documentation/education/tech.htm</a></p>   |
| Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences | <p>The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see <a href="https://www.onetonline.org/help/online/">https://www.onetonline.org/help/online/</a></p>  |
| Educational Supply  | <p>The CCCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: <a href="https://datamart.cccco.edu">https://datamart.cccco.edu</a></p> <p>The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see <a href="https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions">https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions</a></p> |
| Student Metrics and Demographics  | <p>DataVista, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: <a href="https://datavista.cccco.edu/">https://datavista.cccco.edu/</a></p>   |
| Population and Occupation Demographics  | <p>The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: <a href="https://www.census.gov/programs-surveys/acs">https://www.census.gov/programs-surveys/acs</a></p> <p>Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: <a href="https://usa.ipums.org/usa/about.shtml">https://usa.ipums.org/usa/about.shtml</a></p>  |

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