

**Labor Market Analysis for Program Recommendation**

**Engineering Technology Occupations**

**Diablo Valley College**

## Prepared by the San Francisco Bay Center of Excellence for Labor Market Research

## October 2023

## Recommendation

Based on all available data, there appears to be an “undersupply” of Engineering Technology workers compared to the demand for this cluster of occupations in the Bay region and in the East Bay sub-region (Alameda, Contra Costa counties). There is a projected annual gap of about 821 students in the Bay region and 180 students in the East Bay Sub-Region.

## Introduction

This report provides student outcomes data on employment and earnings for TOP 0924.00 - Engineering Technology, General (requires Trigonometry) programs in the state and region. It is recommended that these data be reviewed to better understand how outcomes for students taking courses on this TOP code compare to potentially similar programs at colleges in the state and region, as well as to outcomes across all CTE programs at Diablo Valley College and in the region.

This report profiles Engineering Technology Occupations in the 12 county Bay region and in the East Bay sub-region for a proposed new Tesla Manufacturing Development Program, Tesla START Program at Diablo Valley College.

Labor market information (LMI) is not available at the eight-digit SOC Code level for Robotics Technicians (17-3024.01), therefore, the data shown in Tables 1 and 2 is for Electro-Mechanical and Mechatronics Technologists and Technicians(at the six digit SOC level) and likely overstates demand for Robotics Technicians.

Labor market information (LMI) is not available at the eight-digit SOC Code level for either Mechatronics Engineers (17-2199.05) or Robotics Engineers (17-2199. 08), therefore, the data shown in Tables 1 and 2 is for Engineers, All Other (at the six digit SOC level) and likely overstates demand for both Mechatronics Engineers and Robotics Engineers. Tables 4a and 4b use job postings data from Burning Glass at the eight-digit SOC Code level for Robotics Technicians, Mechatronics Engineers and Robotics Engineers.

* **Engineers, All Other (17-2199):** All engineers not listed separately.
  Entry-Level Educational Requirement: Bachelor’s degree
  Training Requirement: None
  Percentage of Community College Award Holders or Some Postsecondary Coursework: 14%
* **Electro-Mechanical and Mechatronics Technologists and Technicians (17-3024):** Operate, test, maintain, or calibrate unmanned, automated, servo-mechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment at worksites, such as oil rigs, deep ocean exploration, or hazardous waste removal. May assist engineers in testing and designing robotics equipment.
  Entry-Level Educational Requirement: Associate’s degree
  Training Requirement: None
  Percentage of Community College Award Holders or Some Postsecondary Coursework: 51%

## Occupational Demand

**Table 1. Employment Outlook for Engineering Technology Occupations in Bay Region**

| **Occupation** | **2021 Jobs** | **2026 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Engineers, All Other | 10,490 | 10,999 | 510 | 5% | 3,964 | 793 | $46 | $60 |
| Electro-Mechanical and Mechatronics Technologists and Technicians | 481 | 509 | 28 | 6% | 278 | 56 | $21 | $30 |
| **Total** | **10,971** | **11,509** | **538** | **5%** | **4,242** | **849** |  |  |
| Source: Lightcast 2022.3 |
| **Bay Region includes:** Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties |

**Table 2. Employment Outlook for Engineering Technology Occupations in East Bay Sub-region**

| **Occupation** | **2021 Jobs** | **2026 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Engineers, All Other | 2,167 | 2,302 | 135 | 6% | 849 | 170 | $42 | $53 |
| Electro-Mechanical and Mechatronics Technologists and Technicians | 155 | 163 | 8 | 5% | 88 | 18 | $16 | $26 |
| **Total** | **2,323** | **2,466** | **143** | **6%** | **937** | **188** |  |  |
| Source: Lightcast 2022.3 |
| **East Bay Sub-Region includes:** Alameda, Contra Costa Counties |

### Job Postings in Bay Region and East Bay Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (Oct. 2022 - Sept. 2023)**

| **Occupation** | **Bay Region** | **East Bay** |
| --- | --- | --- |
| Engineers, All Other | 4,931 | 916 |
| Electro-Mechanical and Mechatronics Technologists and Technicians | 961 | 378 |
| Source: Lightcast |

**Table 4a. Top Job Titles for Engineering Technology Occupations for latest 12 months (Oct. 2022 - Sept. 2023) Bay Region**

| **Title** | **Bay** | **Title** | **Bay** |
| --- | --- | --- | --- |
| Full Stack Engineers | 287 | Electronics Technicians | 87 |
| Principal Engineers | 155 | Machine Learning Engineers | 69 |
| Optical Engineers | 118 | Device Engineers | 66 |
| Robotics Engineers | 112 | Mechatronics Engineers | 64 |
| Calibration Technicians | 111 | Cloud Engineers | 52 |
| Platform Engineers | 108 | Electromechanical Assemblers | 51 |
| Instrument Technicians | 102 | Robotics Technicians | 51 |
| Staff Engineers | 95 | Instrumentation Technicians | 50 |
| Test Engineers | 92 | Engineers | 48 |
| Source: Lightcast |

**Table 4b. Top Job Titles for Engineering Technology Occupations for latest 12 months (Oct. 2022 - Sept. 2023) East Bay Sub-Region**

| **Title** | **East Bay** | **Title** | **East Bay** |
| --- | --- | --- | --- |
| Electromechanical Assemblers | 39 | Semiconductor Engineers | 17 |
| Calibration Technicians | 36 | Electromechanical Technicians | 16 |
| Electronics Technicians | 31 | Automation Technicians | 15 |
| Instrument Technicians | 28 | Energy Engineers | 15 |
| Robotics Engineers | 26 | Principal Engineers | 15 |
| Robotics Technicians | 25 | Equipment Engineers | 14 |
| Engineers | 22 | Mechatronics Engineers | 14 |
| Consultant Engineers | 20 | Industrialization Engineers | 12 |
| Instrumentation Technicians | 19 | Rework Operators | 12 |
| Source: Lightcast |

## Industry Concentration

**Table 5. Industries hiring Engineering Technology Workers in Bay Region**

| **Industry - 6 Digit NAICS (No. American Industry Classification) Codes** | **Jobs in Industry (2021)** | **Jobs in Industry (2026)** | **% Change (2021-26)** | **% Occupation Group in Industry (2022)** |
| --- | --- | --- | --- | --- |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) | 1,147 | 1,229 | 7% | 10% |
| Engineering Services | 976 | 1,056 | 8% | 9% |
| Federal Government, Civilian, Excluding Postal Service | 724 | 711 | -2% | 6% |
| Electronic Computer Manufacturing | 709 | 730 | 3% | 6% |
| Research and Development in Biotechnology (except Nanobiotechnology) | 605 | 732 | 21% | 5% |
| Semiconductor and Related Device Manufacturing | 545 | 564 | 3% | 5% |
| Custom Computer Programming Services | 425 | 469 | 10% | 4% |
| Testing Laboratories | 289 | 287 | 0% | 2% |
| Temporary Help Services | 274 | 280 | 2% | 2% |
| Analytical Laboratory Instrument Manufacturing | 144 | 335 | 133% | 2% |
| Source: Lightcast 2022.3 |

**Table 6. Top Employers Posting Engineering Technology Occupations in Bay Region and East Bay Sub-Region (Oct. 2022 - Sept. 2023)**

| **Employer** | **Bay** | **Employer** | **East Bay** |
| --- | --- | --- | --- |
| Apple | 152 | Tesla | 71 |
| Tesla | 148 | Lawrence Livermore National Laboratory | 40 |
| Raytheon Technologies | 86 | Randstad | 29 |
| Motion Recruitment | 85 | UL Solutions | 29 |
| CyberCoders | 76 | PG&E | 23 |
| Capital One | 75 | FM Global | 22 |
| Source: Lightcast |

## Educational Supply

There are four (4) community colleges in the Bay Region issuing 28 awards on average annually (last 3 years ending 2021-22) on TOP 0924.00 - Engineering Technology, General (requires Trigonometry). In the East Bay Sub-Region, there is one (1) community college that issued eight (8) awards on average annually (last 3 years) on this TOP code.

**Table 7. Community College Awards on TOP 0924.00 - Engineering Technology, General (requires Trigonometry) in Bay Region**

| **College** | **Subregion** | **Associate Degree** | **High unit Certificate** | **Low unit Certificate** | **Total** |
| --- | --- | --- | --- | --- | --- |
| Cabrillo | SC-Monterey | 3 | 2 | 12 | 17 |
| Las Positas | East Bay | 8 | 0 | 0 | 8 |
| San Francisco | Mid-Peninsula | 2 | 0 | 0 | 2 |
| San Mateo | Mid-Peninsula | 1 | 0 | 0 | 1 |
| **Total** |  | **14** | **2** | **12** | **28** |
| Source: Data Mart |
| Note: The annual average for awards is 2019-20 to 2021-22. |

## Gap Analysis

Based on the data included in this report, there is a labor market gap in the Bay region with 849 annual openings for the Engineering Technologyoccupational cluster and 28 annual (3-year average) awards for an annual undersupply of 821 students. In the East Bay Sub-Region, there is also a gap with 188 annual openings and eight (8) annual (3-year average) awards for an annual undersupply of 180 students.

## Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0924.00 - Engineering Technology, General (requires Trigonometry)**

| **Metric Outcomes** | **Bay All CTE Programs** | **Diablo Valley All CTE Programs** | **State 0924.00** | **Bay 0924.00** | **East Bay 0924.00** | **Diablo Valley 0924.00** |
| --- | --- | --- | --- | --- | --- | --- |
| Students with a Job Closely Related to Their Field of Study | 74% | 70% | 67% | 81% | N/A | N/A |
| Median Annual Earnings for SWP Exiting Students | $53,090 | $41,892 | $39,006 | $51,522 | $51,637 | $47,498 |
| Median Change in Earnings for SWP Exiting Students | 24% | 27% | 37% | 27% | N/A | N/A |
| Exiting Students Who Attained the Living Wage | 54% | 45% | 58% | 51% | 67% | N/A |
| Source: Launchboard Strong Workforce Program Median of 2018 to 2021. |

## Skills, Certifications and Education

**Table 9. Top Skills for Engineering Technology Occupations in Bay Region (Oct. 2022 - Sept. 2023)**

| **Skill** | **Posting** | **Skill** | **Posting** |
| --- | --- | --- | --- |
| Python (Programming Language) | 1,357 | Scalability | 476 |
| Automation | 860 | Optics | 470 |
| Computer Science | 791 | Debugging | 451 |
| Electrical Engineering | 700 | Scripting | 451 |
| New Product Development | 679 | Data Analysis | 430 |
| C++ (Programming Language) | 618 | Machine Learning | 427 |
| Amazon Web Services | 568 | Algorithms | 423 |
| Project Management | 504 | Test Equipment | 417 |
| Physics | 492 | Full Stack Development | 413 |
| Software Engineering | 485 | Application Programming Interface (API) | 406 |
| Source: Lightcast |

**Table 10. Certifications for Engineering Technology Occupations in Bay Region (Oct. 2022 - Sept. 2023)**

| **Certification** | **Posting** | **Certification** | **Posting** |
| --- | --- | --- | --- |
| Valid Driver's License | 297 | Engineer in Training | 24 |
| Security Clearance | 184 | CDL Class C License | 19 |
| Professional Engineer (PE) License | 53 | Project Management Professional Certification | 16 |
| Top Secret-Sensitive Compartmented Information (TS/SCI Clearance) | 47 | CompTIA Security+ | 15 |
| LEED Accredited Professional (AP) | 26 |  |  |
| Source: Lightcast |

**Table 11. Education Requirements for Engineering Technology Occupations in Bay Region**

| **Education Level** | **Job Postings** | **% of Total** |
| --- | --- | --- |
| High school or GED | 399 | 8% |
| Associate degree | 428 | 8% |
| Bachelor's degree & higher | 4,448 | 84% |
| Source: Lightcast |
| Note: 42% of records have been excluded because they do not include a degree level. As a result, the chart above may not be representative of the full sample. |

## Methodology

Occupations for this report were identified by use of job descriptions and skills listed in O\*Net. Labor demand data is sourced from Lightcast occupation and job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CCCCO Data Mart and CTE Launchboard.

## Sources

O\*Net Online
Lightcast
CTE LaunchBoard www.calpassplus.org
Launchboard
Statewide CTE Outcomes Survey
Employment Development Department Unemployment Insurance Dataset
Living Insight Center for Community Economic Development
Chancellor’s Office MIS system

## Contacts

For more information, please contact:

* Leila Jamoosian, Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (COE), leila@baccc.net
* John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, jcarrese@ccsf.edu or (415) 267-6544