**Mechatronic Technology Occupations**

**Labor Market Information Report**

**Mission College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

March 2020

# Recommendation

Based on all available data, there appears to be an undersupply of Mechatronic Technology workers compared to the demand for this cluster of occupations in the Bay region and in the Silicon Valley sub-region (Santa Clara County). There is a projected annual gap of about 1,275 students in the Bay region and 684 students in the Silicon Valley Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0924.00 - Engineering Technology, General 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 Mission College and in the region.

# Introduction

This report profiles Mechatronic Technology Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at Mission 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 Technicians (at the six digit SOC level). Tables 3, 4, 6, 9, 10 and 11 use job postings data from Burning Glass at the eight-digit SOC Code level for Robotics Technicians (17-3024.01).

|  |
| --- |
| * **Electro-Mechanical Technicians (SOC 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: 53% |
|  |
| * **Electrical** **and Electronics Engineering Technicians (SOC 17-3023):** Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. Excludes “Broadcast Technicians" (27-4012).
 |
| Entry-Level Educational Requirement: Associate's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders *or Some Postsecondary Coursework: 53%* |
|  |
| * **Industrial Engineering Technicians (SOC 17-3026):** Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May perform time and motion studies on worker operations in a variety of industries for purposes such as establishing standard production rates or improving efficiency.
 |
| Entry-Level *Educational Requirement: Associate's degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some *Postsecondary Coursework: 53%* |
|  |
| * **Mechanical Engineering Technicians (SOC 17-3027):** Apply theory and principles of mechanical engineering to modify, develop, test, or calibrate machinery and equipment under direction of engineering staff or physical scientists.
 |
| Entry-Level Educational Requirement: Associate's *degree* |
| Training *Requirement: None* |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 53*%* |

# Occupational Demand

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Electro-Mechanical Technicians |  851  |  855  | 4 | 0% |  444  |  89  | $23.14 | $28.61 |
| Electrical and Electronics Engineering Technicians |  9,300  |  9,316  | 16 | 0% |  4,725  |  945  | $23.14 | $30.68 |
| Industrial Engineering Technicians |  1,101  |  1,223  | 122 | 11% |  688  |  138  | $20.69 | $28.47 |
| Mechanical Engineering Technicians |  1,005  |  1,103  | 97 | 10% |  610  |  122  | $21.91 | $28.47 |
| **TOTAL** |  **12,258**  |  **12,497**  | **239** | **2%** |  **6,467**  |  **1,293**  | **$22.82** | **$30.16** |

*Source: EMSI 2019.4*

**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 Mechatronic Technology Occupations in Silicon Valley Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Electro-Mechanical Technicians |  529  |  508  | -22 | -4% |  253  |  51  | $21.59 | $26.51 |
| Electrical and Electronics Engineering Technicians |  5,457  |  5,341  | -116 | -2% |  2,652  |  530  | $23.19 | $30.84 |
| Industrial Engineering Technicians |  509  |  549  | 40 | 8% |  297  |  59  | $25.49 | $29.57 |
| Mechanical Engineering Technicians |  408  |  425  | 17 | 4% |  219  |  44  | $25.48 | $33.74 |
| **TOTAL** |  **6,903**  |  **6,823**  | **-80** | **-1%** |  **3,422**  |  **684**  | **$23.37** | **$30.59** |

*Source: EMSI 2019.4*

**Silicon Valley Sub-Region** includes Santa Clara County

### Job Postings in Bay Region and Silicon Valley Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (March 2019 - February 2020)**

| Occupation | Bay Region | Silicon Valley |
| --- | --- | --- |
|  Industrial Engineering Technicians | 2,330 | 540 |
|  Electronics Engineering Technicians | 1,758 | 713 |
|  Electro-Mechanical Technicians | 570 | 187 |
|  Mechanical Engineering Technicians | 487 | 183 |
|  Robotics Technicians | 149 | 49 |
|  Electrical Engineering Technicians | 100 | 29 |
|  **TOTAL** | **5,394** | **1,701** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Mechatronic Technology Occupations for latest 12 months (March 2019 - February 2020) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Maintenance Technician | 1,212 | Maintenance Sanitation Team Member, Retail Industry | 61 |
| Electronics Technician | 411 | Low Voltage Technician | 52 |
| Test Technician | 401 | Cable Technician | 44 |
| Maintenance Worker | 319 | Field Technician | 37 |
| Mechanical Technician | 267 | Automation Technician | 36 |
| Electrical Technician | 254 | Industrial Maintenance Technician | 35 |
| Instrumentation Technician | 165 | Mechanic | 34 |
| Engineering Technician | 140 | ElectroMechanical Assembler | 33 |
| Calibration Technician | 130 | Maintenance Associate | 30 |
| Maintenance Engineer | 125 | Service Technician | 29 |
| Electromechanical Technician | 100 | Draft Beer Technician | 28 |
| Mechanical Inspector | 96 | Mechanical Assembler | 24 |
| Technician | 83 | Maintenance Mechanic | 24 |
| Manufacturing Technician | 72 | Maintenance Team Member | 23 |

**Table 4b. Top Job Titles for Mechatronic Technology Occupations for latest 12 months (March 2019 - February 2020) Silicon Valley Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Silicon Valley | Common Title | Silicon Valley |
| Whole Foods Market, Inc. | 115 | The Home Depot Incorporated | 17 |
| Tesla | 59 | Greystar | 17 |
| Lawrence Livermore National Laboratory | 38 | General Dynamics | 17 |
| Outsource | 33 | Dick's Sporting Goods Incorporated | 17 |
| Western Digital | 32 | TTM Technologies | 16 |
| Department of Veterans Affairs | 30 | FedEx | 16 |
| Tesla Motors | 28 | State of California | 15 |
| Apple Inc. | 24 | Trac Intermodal | 15 |
| Jones Lang Lasalle Incorporated | 23 | Goodyear | 15 |
| Enterprise Rent-A-Car | 23 | Varian Medical Systems | 13 |
| Pacific Gas and Electric Company | 20 | National Carwash Solutions | 13 |
| Joby Aviation | 20 | Bart | 13 |
| Hupp Draft Services | 20 | American Airlines | 13 |
| PepsiCo Inc. | 19 | Ubreakifix | 12 |

*Source: Burning Glass*

# Industry Concentration

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2018) | Jobs in Industry (2022) | % Change (2018-22) | % in Industry (2018) |
| Semiconductor and Related Device Manufacturing (334413) | 2,218 | 2,016 | -9% | 18% |
| Electronic Computer Manufacturing (334111) | 1,392 | 1,507 | 8% | 12% |
| Engineering Services (541330) | 827 | 883 | 7% | 7% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 520 | 575 | 11% | 4% |
| Other Electronic Component Manufacturing (334419) | 454 | 366 | -19% | 4% |
| Custom Computer Programming Services (541511) | 405 | 492 | 21% | 3% |
| Printed Circuit Assembly (Electronic Assembly) Manufacturing (334418) | 408 | 453 | 11% | 3% |
| Research and Development in Biotechnology (except Nanobiotechnology) (541714) | 300 | 414 | 38% | 3% |
| Bare Printed Circuit Board Manufacturing (334412) | 303 | 246 | -19% | 3% |
| Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals (334515) | 307 | 284 | -7% | 2% |
| Computer Systems Design Services (541512) | 241 | 275 | 14% | 2% |
| Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing (334220) | 216 | 163 | -25% | 2% |
| Testing Laboratories (541380) | 197 | 206 | 5% | 2% |
| Analytical Laboratory Instrument Manufacturing (334516) | 197 | 187 | -5% | 2% |
| Electromedical and Electrotherapeutic Apparatus Manufacturing (334510) | 184 | 217 | 18% | 2% |
| US Postal Service (901149) | 185 | 147 | -21% | 1% |
| Semiconductor Machinery Manufacturing (333242) | 174 | 195 | 12% | 1% |
| Local Government, Excluding Education and Hospitals (903999) | 163 | 170 | 4% | 1% |
| Other Measuring and Controlling Device Manufacturing (334519) | 139 | 162 | 17% | 1% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 133 | 130 | -2% | 1% |
| Temporary Help Services (561320) | 122 | 125 | 2% | 1% |

*Source: EMSI 2019.4*

**Table 6. Top Employers Posting Mechatronic Technology Occupations in Bay Region and Silicon Valley Sub-Region (March 2019 - February 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Silicon Valley |
| Whole Foods Market, Inc. | 115 | The Home Depot Inc | 17 | Tesla | 49 |
| Tesla | 59 | Greystar | 17 | Lawrence Livermore National Laboratory | 38 |
| Lawrence Livermore National Laboratory | 38 | General Dynamics | 17 | Whole Foods Market, Inc. | 28 |
| Outsource | 33 | Dick's Sporting Goods Inc | 17 | Tesla Motors | 21 |
| Western Digital | 32 | TTM Technologies | 16 | PepsiCo Inc. | 19 |
| Department of Veterans Affairs | 30 | FedEx | 16 | Outsource | 17 |
| Tesla Motors | 28 | State of California | 15 | Jones Lang Lasalle Inc | 16 |
| Apple Inc. | 24 | Trac Intermodal | 15 | Bart | 13 |
| Jones Lang Lasalle Inc | 23 | Goodyear | 15 | Waste Management | 11 |
| Enterprise Rent-A-Car | 23 | Varian Medical Systems | 13 | Enterprise Rent-A-Car | 11 |
| Pacific Gas and Electric Company | 20 | National Carwash Solutions | 13 | Dick's Sporting Goods Incorporated | 11 |
| Joby Aviation | 20 | Bart | 13 | Western Digital | 10 |
| Hupp Draft Services | 20 | American Airlines | 13 | Trac Intermodal | 10 |
| PepsiCo Inc. | 19 | Ubreakifix | 12 | Pleasanton Unified School District | 10 |
| Aramark | 19 | Tekberry | 12 | Pacific Gas and Electric Co | 10 |
| County Sonoma | 18 | Eurofins Scientific | 12 | Lucid Motors Inc | 10 |
| Thermo Fisher Scientific Inc | 17 | Danaher Corporation | 12 | Hupp Draft Services | 10 |

*Source: Burning Glass*

# Educational Supply

There are three (3) community colleges in the Bay Region issuing 18 awards on average annually (last 3 years) on TOP 09240.00 - Engineering Technology, General. There are no colleges in the Silicon Valley Sub-Region issuing awards on average annually (last 3 years) on this TOP code.

**Table 7. Awards on TOP 0924.00 - Engineering Technology, General in Bay Region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Certificate 18+ Units | Certificate Low Unit | Total |
| Cabrillo College  | Santa Cruz-Monterey |  1  |  1  |  7  |  9  |
| City College of San Francisco  | Mid-Peninsula |  1  |  |  |  1  |
| Las Positas College  | East Bay |  8  |  |  |  8  |
| **Total Bay Region** |  **10**  |  **1**  |  **7**  |  **18**  |
| **Total Silicon Valley Sub-Region** | **0** | **0** | **0** | **0** |

# *Source: Data Mart*

Note: The annual average for awards is 2015-16 to 2017-18.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 1,293 annual openings for the Mechatronic Technology occupational cluster and 18 annual (3-year average) awards for an annual undersupply of 1,275 students. In the Silicon Valley Sub-Region, there is also a gap with 684 annual openings and no annual (3-year average) awards for an annual undersupply of 684 students.

# Student Outcomes

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay (All CTE Programs) | Mission College (All CTE Programs) | State (0924.00) | Bay (0924.00) | Silicon Valley (0924.00) | Mission College (0924.00) |
| % Employed Four Quarters After Exit | 74% | 77% | 52% | 63% | n/a | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $10,336 | $8,130 | $8,190 | n/a | n/a |
| Median % Change in Earnings | 46% | 49% | 69% | 59% | n/a | n/a |
| % of Students Earning a Living Wage | 63% | 66% | 52% | 53% | n/a | n/a |

*Source: Launchboard Pipeline (version available on 3/6/20)*

# Skills, Certifications and Education

**Table 9. Top Skills for Mechatronic Technology Occupations in Bay Region (March 2019 - February 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Repair | 2,729 | Lifting Ability | 335 | Multimeters | 190 |
| Hand Tools | 802 | Welding | 327 | Customer Contact | 184 |
| Test Equipment | 778 | Equipment Maintenance | 323 | Microscope | 182 |
| Predictive / Preventative Maintenance | 774 | Quality Assurance and Control | 319 | Facility Maintenance | 170 |
| Schematic Diagrams | 759 | Robotics | 317 | Manual Dexterity | 170 |
| Power Tools | 590 | Electrical Diagrams/Schematics | 266 | Data Entry | 167 |
| Soldering | 559 | Electrical Systems | 259 | Machining | 166 |
| Scheduling | 555 | Technical Support | 256 | Micrometers | 153 |
| Machinery | 536 | Forklift Operation | 246 | Calipers | 151 |
| Wiring | 522 | Occupational Health & Safety | 246 | Electrical Work | 148 |
| Cleaning | 518 | Electrical Engineering | 231 | Project Management | 148 |
| Calibration | 513 | Power Supplies | 220 | Retail Industry Knowledge | 147 |
| Electronics Industry Knowledge | 485 | Packaging | 197 | Cabling | 146 |
| Oscilloscopes | 444 | Electromechanical Assemblies | 193 | Telecommunications | 145 |
| Customer Service | 376 | Hydraulics | 192 | Electronic Circuits | 144 |

*Source: Burning Glass*

**Table 10. Certifications for Mechatronic Technology Occupations in Bay Region (March 2019 - February 2020)**

Note: 73% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |
| --- | --- | --- | --- |
| Certification | Postings | Certification | Postings |
| Driver's License | 1,025 | American Society For Quality (ASQ) Certification | 16 |
| Security Clearance | 115 | First Aid CPR AED | 14 |
| CDL Class C | 71 | Master Mechanic | 13 |
| Forklift Operator Certification | 49 | CLD Class B | 13 |
| Automotive Service Excellence (ASE) Certification | 44 | Certified Pool/Spa Operator | 12 |
| Airframe and Powerplant (A and P) Certification | 34 | Soldering Certification | 11 |
| IPC Certification | 30 | Occupational Safety and Health Administration Certification | 11 |
| Certified A+ Technician | 23 | OSHA Safety 10 Hour | 10 |
| CDL Class A | 23 | Business License | 7 |
| Electrician Certification | 22 | BICSI Certification | 7 |
| Basic Life Saving (BLS) | 19 | Apple Certified Macintosh Technician | 7 |
| Basic Cardiac Life Support Certification | 19 | Air Brake Certified | 7 |

*Source: Burning Glass*

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

Note: 47% of records have been excluded because they do not include a degree level. As a result, the chart below may not be representative of the full sample.

|  |  |  |
| --- | --- | --- |
| Education (minimum advertised) | Latest 12 Mos. Postings | Percent 12 Mos. Postings |
| High school or vocational training | 1,662 | 58% |
| Associate Degree | 640 | 22% |
| Bachelor’s Degree or Higher | 443 | 20% |

*Source: Burning Glass*

# Methodology

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

# Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard [www.calpassplus.org/Launchboard/](http://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:

* Doreen O’Donovan, Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (CoE), doreen@baccc.net or (831) 479-6481
* John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, jcarrese@ccsf.edu or (415) 267-6544