**** **Electrical Technology Occupations**

**Labor Market Information Report**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

August 2018

# Recommendation

Based on all available data, there appears to be a significant undersupply of Electrical Technology workers compared to the demand for this cluster of occupations in the Bay region and in the East Bay sub-region (Alameda and Contra Costa). The gap is about 4,490 students annually in the Bay region and about 1,160 students annually in the East Bay.

This report also provides student outcomes data on employment and earnings for programs on TOP 0934.00 - Electronics and Electric Technology in the state and region. It is recommended that this data be reviewed to better understand how outcomes for Laney College students taking courses on this TOP code compare to potentially similar programs at colleges in the sub-region, region and state, as well as to outcomes across all CTE programs at Laney College and in the region.

# Introduction

This report profiles Electrical Technology Occupations in the 12 county Bay region and in the East Bay sub-region for review of an existing program at Laney College.

|  |
| --- |
| * **Electricians (SOC 47-2111):** Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems. Excludes “Security and Fire Alarm Systems Installers" (49-2098). |
| *Entry-Level Educational Requirement: High school diploma or equivalent* |
| *Training Requirement: Apprenticeship* |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 47%* |
|  |
| * **Electric Motor, Power Tool, and** **Related Repairers (SOC 49-2092):** Repair, maintain, or install electric motors, wiring, or switches. |
| *Entry-Level Educational Requirement: High school diploma or equivalent* |
| *Training Requirement: Moderate-term on-the-job training* |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 46%* |
|  |
| * **Electrical and Electronics Installers and Repairers, Transportation Equipment** **(SOC 49-2093):** Install, adjust, or maintain mobile electronics communication equipment, including sound, sonar, security, navigation, and surveillance systems on trains, watercraft, or other mobile equipment. Excludes “Avionics Technicians" (49-2091) and "Electronic Equipment Installers and Repairers, Motor Vehicles" (49-2096). |
| *Entry-Level Educational Requirement: Postsecondary nondegree award* |
| *Training Requirement: Long-term on-the-job training* |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 52%* |
|  |
| * **Electrical Power-Line Installers and Repairers (SOC 49-9051):** Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers. Excludes “Electrical and Electronics Repairers, Powerhouse, Substation, and Relay" (49-2095). |
| *Entry-Level Educational Requirement: High school diploma or equivalent* |
| *Training Requirement: Long-term on-the-job training* |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 48%* |
|  |
| * **Electrical and Electronic Equipment Assemblers** **(SOC 51-2022):** Assemble or modify electrical or electronic equipment, such as computers, test equipment telemetering systems, electric motors, and batteries. |
| *Entry-Level Educational Requirement: High school diploma or equivalent* |
| *Training Requirement: Moderate-term on-the-job training* |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 30%* |

# Occupational Demand

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Annual Ope-nings | 10% Hourly Wage | Median Hourly Wage |
| Electricians | 19,227 | 22,338 | 3,111 | 16% | 14,390 | 2,878 | $17.47 | $35.94 |
| Electric Motor, Power Tool, and Related Repairers | 448 | 477 | 29 | 6% | 241 | 48 | $14.39 | $23.11 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment | 653 | 666 | 13 | 2% | 299 | 60 | $25.53 | $38.55 |
| Electrical Power-Line Installers and Repairers | 1,195 | 1,417 | 222 | 19% | 726 | 145 | $29.57 | $50.80 |
| Electrical and Electronic Equipment Assemblers | 13,160 | 13,053 | (107) | (1%) | 7,911 | 1,582 | $11.30 | $16.78 |
| **Total** | **34,682** | **37,951** | **3,269** | **9%** | **23,566** | **4,713** | **$15.66** | **$29.06** |

*Source: EMSI 2018.2*

**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 Electrical Technology Occupations in East Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Electricians | 5,574 | 6,530 | 956 | 17% | 4,232 | 846 | $16.45 | $32.23 |
| Electric Motor, Power Tool, and Related Repairers | 259 | 278 | 19 | 7% | 142 | 28 | $13.15 | $24.21 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment | 374 | 379 | 5 | 1% | 168 | 34 | $25.76 | $38.42 |
| Electrical Power-Line Installers and Repairers | 345 | 414 | 70 | 20% | 217 | 43 | $30.69 | $50.97 |
| Electrical and Electronic Equipment Assemblers | 2,547 | 2,634 | 87 | 3% | 1,593 | 319 | $11.01 | $15.91 |
| **TOTAL** | **9,098** | **10,235** | **1,137** | **12%** | **6,352** | **1,270** | **$15.75** | **$28.40** |

*Source: EMSI 2018.2*

**East Bay Sub-Region** includes Alameda and 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 (May 2017 - April 2018)**

|  |  |  |
| --- | --- | --- |
| Occupation | Bay Region | East Bay |
| Electricians (47-2111.00) | 870 | 279 |
| Electrical and Electronic Equipment Assemblers (51-2022.00) | 306 | 117 |
| Electrical Power-Line Installers and Repairers (49-9051.00) | 20 | 12 |
| Electric Motor, Power Tool, and Related Repairers (49-2092.00) | 15 | 5 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093.00) | 2 | 1 |
| **Total** | **1,213** | **414** |

*Source: Burning Glass*

**Table 4. Top Job Titles for Electrical Technology Occupations for latest 12 months (May 2017 - April 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Common Title | Bay | East Bay | Common Title | Bay | East Bay |
| Electrician | 477 | 148 | Industrial Electrician | 29 | 8 |
| Journeyman Electrician | 205 | 66 | Mechanical Assembly | 24 | 6 |
| Mechanical Assembler | 120 | 46 | Lead Electrician | 23 | 8 |
| Maintenance Electrician | 48 | 23 | Solar Electrician | 20 | 8 |
| Electronic Assembler | 45 | 14 | Commercial Electrician | 17 | 3 |
| Electro-Mechanical Assembler | 38 | 19 | Electrical Assembler | 17 | 9 |

*Source: Burning Glass*

# Industry Concentration

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Industry – 6 Digit NAICS (No. American Industry Classification) Codes** | **Jobs in Industry (2017)** | **Jobs in Industry (2022)** | **% Change (2017-22)** | **% in Industry (2017)** |
| Electrical Contractors and Other Wiring Installation Contractors (238210) | 13,614 | 16,352 | 20% | 39.3% |
| Semiconductor and Related Device Manufacturing (334413) | 3,360 | 3,157 | (6%) | 9.7% |
| Electronic Computer Manufacturing (334111) | 2,400 | 2,619 | 9% | 6.9% |
| Local Government, Excluding Education and Hospitals (903999) | 1,073 | 1,132 | 5% | 3.1% |
| Other Electronic Component Manufacturing (334419) | 691 | 495 | (28%) | 2.0% |
| Temporary Help Services (561320) | 672 | 765 | 14% | 1.9% |
| Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals (334515) | 541 | 429 | (21%) | 1.6% |
| Printed Circuit Assembly (Electronic Assembly) Manufacturing (334418) | 524 | 612 | 17% | 1.5% |
| Bare Printed Circuit Board Manufacturing (334412) | 467 | 304 | (35%) | 1.3% |
| Radio & TV Broadcasting & Wireless Communications Equipment Manufacturing (334220) | 464 | 450 | (3%) | 1.3% |
| Residential Remodelers (236118) | 414 | 437 | 6% | 1.2% |
| Plumbing, Heating, and Air-Conditioning Contractors (238220) | 410 | 450 | 10% | 1.2% |
| Analytical Laboratory Instrument Manufacturing (334516) | 408 | 357 | (13%) | 1.2% |
| Power & Communication Line & Related Structures Construction (237130) | 405 | 566 | 40% | 1.2% |
| Commercial and Institutional Building Construction (236220) | 343 | 390 | 14% | 1.0% |

*Source: EMSI 2018.1*

**Table 6. Top Employers Posting Electrical Technology Occupations in Bay and East Bay (May 2017 - April 2018)**

Note: 46% of records in the region and 48% in the sub-region have been excluded because they do not include an employer. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employer** | **Bay** | **Employer** | **Bay** | **Employer** | **East Bay** |
| Outsource | 29 | California State University Office Of The Chancellor | 9 | Outsource | 9 |
| Tesla Motors | 16 | City Of San Jose City Hall | 9 | University California | 7 |
| Grus Construction | 13 | Grus | 9 | Koch Industries, Incorporated | 6 |
| Vivint Solar | 12 | Knights Electric Incorporated | 9 | Tesla Motors | 6 |
| Solarcity | 11 | Next Page | 9 | Uc San Diego | 6 |
| California State University | 10 | San Jose State University | 9 | Utiliquest | 6 |

*Source: Burning Glass*

# Educational Supply

On the supply side, there are 9 Community Colleges issuing 189 awards annually on TOP 0934 - Electronics and Electric Technology. There is one other postsecondary issuing 35 certificates annually for a total of 224 awards in the region. Five of these colleges are in the East Bay sub region, issuing 111 awards annually.

**Table 7. Award on 0934.00 Electronics and Electric Technology in Bay Region and on CIP 47.0101 Electrical/Electronics Equipment Installation and Repair, General**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | CC Headcount | Associate Degrees | Certificates or Other Credit Awards | Total Awards |
| Chabot | East Bay | 181 | 4 | 10 | 14 |
| Contra Costa | East Bay | 44 | 0 | 4 | 4 |
| Diablo Valley | East Bay | 281 | 9 | 17 | 26 |
| Laney | East Bay | on another TOP | 9 | 24 | 33 |
| Los Medanos | East Bay | 216 | 14 | 20 | 34 |
| Marin | North Bay | 18 | 0 | 0 | 0 |
| San Francisco | Mid-Peninsula | 98 | 2 | 11 | 13 |
| San Mateo | Mid-Peninsula | 171 | 0 | 43 | 43 |
| Santa Rosa | North Bay | 191 | 5 | 11 | 16 |
| Skyline | Mid-Peninsula | 79 | 0 | 6 | 6 |
| CET Sobrato | Silicon Valley | n/a | 0 | 35 | 35 |
| **Total Bay Region** | | **1,201** | **43** | **181** | **224** |
| **Total East Bay Sub-Region** | | **756** | **36** | **75** | **111** |

# *Source: IPEDS, Data Mart and Launchboard*

NOTE: Headcount of students who took one or more courses is for 2016-17. For Community Colleges, the annual average for Associate Degrees and Certificates is 2014-17. The annual average is 2013-16 for CET Sobrato (who had no awards listed in IPEDS for the most current year 2016).

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 4,713 annual openings for the Electrical Technology occupational cluster and 224 annual awards for an annual undersupply of 4,489. In the East Bay, there is also a gap with 1,270 annual openings and 111 annual awards for an annual undersupply of 1,159.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0934.00 - Electronics and Electric Technology**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2015-16** | **Bay  (All CTE Programs)** | **Laney**  **(All CTE Programs)** | **State (093400)** | **Bay (093400)** | **East Bay (093400)** | **Laney (093400)** | **Top College on 093400 in the region** | |
| % Employed Four Quarters After Exit | 74% | 67% | 69% | 74% | 76% | 68%  (15 students) | Los Medanos | 81%  (39 students) |
| Median Earnings Two Quarters After Exit | $10,310 | $9,960 | $9,030 | $11,215 | $11,110 | $8,410 | Diablo Valley | $14,000  (no. of students n/a) |
| Median % Change in Earnings | 46% | 46% | 51% | 45% | 78% | 165% | Laney | 165%  (no. of students n/a) |
| % of Students Earning a Living Wage | 63% | 61% | 59% | 66% | 65% | 63%  (12 students) | San Mateo | 76%  (29 students) |

*Source: Launchboard Pipeline (version available on 5/14/18)*

# Skills, Certificates and Education

**Table 9. Top Skills for Electrical Technology Occupations in Bay Region (May 2017 - April 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skill** | **Postings** | **Skill** | **Postings** | **Skill** | **Postings** |
| Electrical Work | 794 | Voltmeters | 107 | Teamwork / Collaboration | 67 |
| Repair | 542 | Scheduling | 105 | Customer Service | 66 |
| Hand Tools | 346 | Electrical Diagrams/Schematics | 103 | Lifting Ability | 66 |
| Wiring | 345 | Oscilloscopes | 93 | New Construction | 66 |
| Electrical Systems | 290 | Occupational Health & Safety | 92 | HVAC | 65 |
| Schematic Diagrams | 240 | Power Supplies | 91 | Electromechanical Assemblies | 64 |
| Transformers | 228 | Quality Assurance and Control | 90 | National Electrical Code | 64 |
| Electrical Wiring | 197 | Rigid Conduit | 85 | Electrical Conduit | 63 |
| Mechanical Assembly | 168 | Circuit Breakers | 83 | Welding | 63 |
| Test Equipment | 162 | Electrical Engineering | 83 | Electrical Devices | 59 |
| Power Tools | 146 | Wiring Repair | 83 | Industrial Electrical Experience | 57 |
| Machinery | 144 | Hazard Identification | 80 | Recruiting | 54 |
| Wiring Diagrams | 122 | Conveyor Systems | 79 | Safety Codes | 54 |
| Soldering | 116 | Electrical Experience | 72 | Conduit Bending | 53 |

*Source: Burning Glass*

**Table 10. Certifications for Electrical Technology Occupations in the Bay Region (May 2017 - April 2018)**

Note: 61% 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** |
| Electrician Certification | 258 | Electrical Certification | 22 |
| Driver's License | 226 | CDL Class C | 21 |

*Source: Burning Glass*

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

Note: 71% 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** |
| High school or vocational training | 327 (94%) |
| Associate Degree | 18 (5%) |
| Bachelor’s Degree | 2 (1%) |

*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:

* Karen Beltramo, Data Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (CoE), [karen@baccc.net](mailto:karen@baccc.net) or (831) 332-1253
* John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, [jcarrese@ccsf.edu](mailto:jcarrese@ccsf.edu) or (415) 452-5529