

# Design for Manufacturing Occupations

# Labor Market Information Report

# Diablo Valley College

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

**January 2021**

## Recommendation

Based on all available data, there appears to be an “undersupply” of Design for Manufacturing 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 counties). There is a projected annual gap of about 1,695 students in the Bay region and 417 students in the East Bay Sub-Region.

## Introduction

This report provides student outcomes data on employment and earnings for TOP 0956.00 - Manufacturing and Industrial Technology 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 Design for Manufacturing Occupations in the 12 county Bay region and in the East Bay sub-region for a proposed new program at Diablo Valley College.

* **Electrical and Electronic Engineering Technologists and Technicians (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: 61%
* **Industrial Engineering Technologists and Technicians (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: 51%
* **Mechanical Engineering Technologists and Technicians (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: 51%
* **Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other (17-3098):** All engineering technicians, except drafters, not listed separately.
  Entry-Level Educational Requirement: Associate’s degree
  Training Requirement: None
  Percentage of Community College Award Holders or Some Postsecondary Coursework: 51%
* **Computer Numerically Controlled Tool Programmers (51-9162):** Develop programs to control machining or processing of materials by automatic machine tools, equipment, or systems. May also set up, operate, or maintain equipment.
  Entry-Level Educational Requirement: Postsecondary nondegree award
  Training Requirement: Moderate-term on-the-job training
  Percentage of Community College Award Holders or Some Postsecondary Coursework: 46%

## Occupational Demand

**Table 1. Employment Outlook for Design for Manufacturing Occupations in Bay Region**

| **Occupation** | **2019 Jobs** | **2024 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Electrical and Electronic Engineering Technologists and Technicians | 9,625 | 9,537 | -88 | -1% | 4,800 | 960 | $25.03 | $32.23 |
| Industrial Engineering Technologists and Technicians | 2,061 | 2,120 | 59 | 3% | 1,078 | 216 | $23.35 | $28.97 |
| Mechanical Engineering Technologists and Technicians | 786 | 860 | 74 | 9% | 472 | 94 | $22.73 | $30.51 |
| Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other | 3,276 | 3,409 | 133 | 4% | 1,770 | 354 | $25.08 | $32.52 |
| Computer Numerically Controlled Tool Programmers | 667 | 718 | 51 | 8% | 407 | 81 | $31.45 | $38.90 |
| **Total** | **16,415** | **16,644** | **229** | **1%** | **8,527** | **1,705** | **$24.98** | **$32.07** |
| Source: EMSI 2020.4 |

**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 Design for Manufacturing Occupations in East Bay Sub-region**

| **Occupation** | **2019 Jobs** | **2024 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Electrical and Electronic Engineering Technologists and Technicians | 2,069 | 2,064 | -5 | -0% | 1,017 | 203 | $22.34 | $28.46 |
| Industrial Engineering Technologists and Technicians | 878 | 883 | 5 | 1% | 437 | 87 | $21.63 | $27.12 |
| Mechanical Engineering Technologists and Technicians | 182 | 208 | 26 | 14% | 119 | 24 | $18.97 | $25.36 |
| Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other | 803 | 846 | 43 | 5% | 442 | 88 | $24.61 | $31.02 |
| Computer Numerically Controlled Tool Programmers | 123 | 138 | 15 | 12% | 82 | 16 | $30.29 | $37.36 |
| **Total** | **4,055** | **4,139** | **84** | **2%** | **2,097** | **418** | **$22.73** | **$28.81** |
| Source: EMSI 2020.4 |

**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 (Dec 2019-Nov 2020)**

| **Occupation** | **Bay Region** | **East Bay** |
| --- | --- | --- |
| Industrial Engineering Technicians | 2,127 | 830 |
| Electronics Engineering Technicians | 1,683 | 613 |
| Mechanical Engineering Technicians | 488 | 245 |
| Electrical Engineering Technicians | 66 | 38 |
| Source: Burning Glass |

**Table 4a. Top Job Titles for Design for Manufacturing Occupations for latest 12 months (Dec 2019-Nov 2020) Bay Region**

| **Title** | **Bay** | **Title** | **Bay** |
| --- | --- | --- | --- |
| Maintenance Technician | 453 | Equipment Maintenance Technician | 41 |
| Test Technician | 214 | Draft Beer Technician | 39 |
| Electrical Technician | 97 | Mechanical Inspector | 38 |
| Electromechanical Technician | 95 | Maintenance Technician I | 38 |
| Mechanical Technician | 91 | Engineering Technician | 35 |
| Electronics Technician | 75 | Automation Technician | 35 |
| Maintenance Worker | 74 | Automotive Maintenance Technician | 27 |
| Low Voltage Technician | 52 | Maintenance Associate | 26 |
| Electronic Technician | 43 | Senior Maintenance Technician | 25 |
| Source: Burning Glass |

**Table 4b. Top Job Titles for Design for Manufacturing Occupations for latest 12 months (Dec 2019-Nov 2020) East Bay Sub-Region**

| **Title** | **East Bay** | **Title** | **East Bay** |
| --- | --- | --- | --- |
| Maintenance Technician | 184 | Electronic Technician | 20 |
| Electromechanical Technician | 66 | Service Technician Industrial Boilers and Water Treatment Equipment | 16 |
| Test Technician | 61 | Draft Beer Technician | 16 |
| Mechanical Technician | 61 | Automation Technician | 14 |
| Electrical Technician | 56 | Equipment Maintenance Technician | 13 |
| Mechanical Inspector | 31 | Low Voltage Technician | 12 |
| Electronics Technician | 31 | Maintenance Technician I | 11 |
| Maintenance Worker | 27 | Maintenance Associate | 11 |
| Senior Maintenance Technician | 22 | Automotive Maintenance Technician | 11 |
| Source: Burning Glass |

## Industry Concentration

**Table 5. Industries hiring Design for Manufacturing Workers in Bay Region**

| **Industry – 6 Digit NAICS (No. American Industry Classification) Codes** | **Jobs in Industry (2019)** | **Jobs in Industry (2024)** | **% Change (2019-24)** | **% Occupation Group in Industry (2019)** |
| --- | --- | --- | --- | --- |
| Semiconductor and Related Device Manufacturing | 1,968 | 1,784 | -9% | 12% |
| Electronic Computer Manufacturing | 1,608 | 1,687 | 5% | 10% |
| Engineering Services | 1,072 | 1,130 | 5% | 7% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) | 920 | 1,014 | 10% | 6% |
| Research and Development in Biotechnology (except Nanobiotechnology) | 576 | 724 | 26% | 4% |
| Custom Computer Programming Services | 509 | 593 | 16% | 3% |
| Testing Laboratories | 486 | 493 | 2% | 3% |
| Other Electronic Component Manufacturing | 404 | 329 | -19% | 2% |
| Printed Circuit Assembly (Electronic Assembly) Manufacturing | 389 | 397 | 2% | 2% |
| Federal Government, Civilian, Excluding Postal Service | 346 | 346 | 0% | 2% |
| Source: EMSI 2020.4 |

**Table 6. Top Employers Posting Design for Manufacturing Occupations in Bay Region and East Bay Sub-Region (Dec 2019-Nov 2020)**

| **Employer** | **Bay** | **Employer** | **East Bay** |
| --- | --- | --- | --- |
| Tesla | 98 | Tesla | 76 |
| Whole Foods Market, Inc. | 63 | Lawrence Livermore National Laboratory | 39 |
| Lawrence Livermore National Laboratory | 39 | Tesla Motors | 17 |
| Amazon | 31 | PepsiCo Inc. | 15 |
| Hupp Draft Services | 30 | Hupp Draft Services | 14 |
| Greystar | 29 | Fm Industries Incorporated | 14 |
| Western Digital | 25 | Amazon | 13 |
| Joby Aviation | 25 | Tesla Energy Operations | 12 |
| Goodyear | 24 | Tms Company | 11 |
| Bridgestone / Firestone | 24 | Tm Engineering | 11 |
| Kelly | 22 | Sandia Corporation | 11 |
| Flagship Facility Services, Inc | 21 | Ultimate | 10 |
| Tesla Motors | 20 | Mettler Toledo | 10 |
| Employnet | 19 | Lucid Motors Inc | 10 |
| Source: Burning Glass |

## Educational Supply

There are four (4) community colleges in the Bay Region issuing 10 awards on average annually (last 3 years ending 2018-19) on TOP 0956.00 - Manufacturing and Industrial Technology. In the East Bay Sub-Region, there is one (1) community college that issued one (1) award on average annually (last 3 years) on this TOP code.

**Table 7. Community College Awards on TOP 0956.00 - Manufacturing and Industrial Technology in Bay Region**

| **College** | **Subregion** | **Associate** | **Certificate Low** | **Total** |
| --- | --- | --- | --- | --- |
| De Anza | Silicon Valley | 3 | 2 | 5 |
| Diablo Valley | East Bay | 1 | 0 | 1 |
| San Francisco | Mid-Peninsula | 0 | 3 | 3 |
| Solano | North Bay | 0 | 1 | 1 |
| **Total** |  | **4** | **6** | **10** |
| Source: Data Mart |

*Note: The annual average for awards is 2016-17 to 2018-19.*

## Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 1,705 annual openings for the Design for Manufacturing occupational cluster and 10 annual (3-year average) awards for an annual undersupply of 1,695 students. In the East Bay Sub-Region, there is also a gap with 418 annual openings and 1 annual (3-year average) award for an annual undersupply of 417 students.

## Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0956.00 - Manufacturing and Industrial Technology**

| **2017-18** | **Bay****All CTE Program** | **Diablo Valley** **All CTE Program** | **State 0956.00** | **Bay 0956.00** | **East Bay 0956.00** | **Diablo Valley 0956.00** |
| --- | --- | --- | --- | --- | --- | --- |
| % Employed Four Quarters After Exit | 67% | 60% | 71% | 79% | 85% | 73% |
| Median Quarterly Earning Two Quarters After Exit | $11,466 | $8,979 | $10,601 | $13,075 | $12,656 | $16,005 |
| Median % Change in Earning | 31% | 35% | 36% | 39% | 67% | NA |
| % of Students Earning a Living Wage | 53% | 39% | 68% | 67% | 64% | 75% |
| Source: Launchboard Pipeline (version available on August 2020) |

## Skills, Certifications and Education

**Table 9. Top Skills for Design for Manufacturing Occupations in Bay Region (Dec 2019-Nov 2020)**

| **Skill** | **Posting** | **Skill** | **Posting** |
| --- | --- | --- | --- |
| Repair | 2,304 | Equipment Maintenance | 277 |
| Predictive / Preventative Maintenance | 759 | Forklift Operation | 272 |
| Hand Tools | 745 | Oscilloscopes | 270 |
| Schematic Diagrams | 635 | Electrical Systems | 267 |
| Test Equipment | 568 | Lifting Ability | 239 |
| Power Tools | 479 | Quality Assurance and Control | 238 |
| Machinery | 472 | Robotics | 237 |
| Scheduling | 455 | Electrical Diagrams / Schematics | 221 |
| Soldering | 445 | Customer Service | 210 |
| Cleaning | 437 | Technical Support | 206 |
| Wiring | 383 | Occupational Health and Safety | 205 |
| Welding | 342 | Electrical Engineering | 202 |
| Electronics Industry Knowledge | 321 | Machining | 193 |
| Calibration | 311 | Hydraulics | 188 |
| Source: Burning Glass |

**Table 10. Certifications for Design for Manufacturing Occupations in Bay Region (Dec 2019-Nov 2020)**

| **Certification** | **Posting** | **Certification** | **Posting** |
| --- | --- | --- | --- |
| Driver's License | 895 | Master Mechanic | 13 |
| Security Clearance | 78 | Airframe and Powerplant (A and P) Certification | 13 |
| Automotive Service Excellence (ASE) Certification | 60 | Certified Quality Inspector (CQI) | 11 |
| Cdl Class C | 37 | Cdl Class B | 11 |
| OSHA Forklift Certification | 34 | Welding Certification | 10 |
| IPC Certification | 27 | Certified Pest Control | 10 |
| CDL Class A | 25 | Business License | 7 |
| American Society For Quality (ASQ) Certification | 18 | Project Management Certification | 6 |
| Occupational Safety and Health Administration Certification | 17 | Department of Transportation (DOT) Medical Certification | 6 |
| Electrician Certification | 16 | Certified Industrial Hygienist | 6 |
| Source: Burning Glass |

*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.*

**Table 11. Education Requirements for Design for Manufacturing Occupations in Bay Region (Dec 2019-Nov 2020)**

| **Education (minimum advertised)** | **Latest 12 Mos. Postings** | **Percent 12 Mos. Postings** |
| --- | --- | --- |
| High school or vocational training | 1,498 | 63% |
| Associate's degree | 479 | 20% |
| Bachelor's degree | 318 | 13% |
| Master's degree and higher | 73 | 4% |
| 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/
Statewide CTE Outcomes Survey
Employment Development Department Unemployment Insurance Dataset
Living Insight Center for Community Economic Development
Chancellor’s Office MIS system

## Contacts

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