

# Labor Market Analysis for Program Recommendation

# Additive Manufacturing Technology Occupations

# De Anza College

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

**February 2022**

## Recommendation

Based on all available data, there appears to be an “undersupply” of Additive Manufacturing 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 534 students in the Bay region and 226 students in the Silicon Valley 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 De Anza College and in the region.

This report profiles Additive Manufacturing Technology Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new Additive Manufacturing Technology - 3D Design and Production program at De Anza College.

* **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%
* **Computer Numerically Controlled Tool Operators (51-9161):** NA
  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%
* **Computer Numerically Controlled Tool Programmers (51-9162):** NA
  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 Additive Manufacturing Technology Occupations in Bay Region**

| **Occupation** | **2020 Jobs** | **2025 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Industrial Engineering Technologists and Technicians | 1,688 | 1,798 | 110 | 7% | 1,002 | 200 | $28 | $56 |
| Computer Numerically Controlled Tool Operators | 2,440 | 2,406 | -33 | -1% | 1,317 | 263 | $19 | $46 |
| Computer Numerically Controlled Tool Programmers | 614 | 671 | 57 | 9% | 404 | 81 | $36 | $67 |
| **Total** | **4,742** | **4,875** | **133** | **3%** | **2,723** | **544** |  |  |
| Source: EMSI 2021.3 |

**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 Additive Manufacturing Technology Occupations in Silicon Valley Sub-region**

| **Occupation** | **2020 Jobs** | **2025 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Industrial Engineering Technologists and Technicians | 529 | 567 | 38 | 7% | 318 | 64 | $28 | $57 |
| Computer Numerically Controlled Tool Operators | 1,268 | 1,200 | -67 | -5% | 643 | 129 | $19 | $46 |
| Computer Numerically Controlled Tool Programmers | 320 | 335 | 14 | 5% | 188 | 38 | $39 | $71 |
| **Total** | **2,117** | **2,102** | **-15** | **-1%** | **1,149** | **231** |  |  |
| Source: EMSI 2021.3 |

**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 (Feb 2021 - Jan 2022)**

| **Occupation** | **Bay Region** | **Silicon Valley** |
| --- | --- | --- |
| Industrial Engineering Technicians | 2,824 | 613 |
| Computer Numerically Controlled Tool Operators | 592 | 301 |
| Computer Numerically Controlled Tool Programmers | 348 | 142 |
| Source: Burning Glass |

**Table 4a. Top Job Titles for Additive Manufacturing Technology Occupations for latest 12 months (Feb 2021 - Jan 2022) Bay Region**

| **Title** | **Bay** | **Title** | **Bay** |
| --- | --- | --- | --- |
| Maintenance Technician | 560 | CNC Operator | 46 |
| CNC Programmer | 150 | Maintenance Associate | 38 |
| Automotive Maintenance Technician | 96 | Maintenance Technician I | 33 |
| CNC Operator | 93 | Machine Operator | 28 |
| Maintenance Technician III | 90 | Manufacturing Engineering Technician | 27 |
| Maintenance Worker | 75 | Maintenance Engineer | 22 |
| Industrial Maintenance Technician | 50 | Fleet Maintenance Technician | 22 |
| Equipment Maintenance Technician | 50 | CNC Mill Operator | 20 |
| Maintenance Technician II | 49 | Manufacturing Maintenance Technician | 19 |
| Source: Burning Glass |

**Table 4b. Top Job Titles for Additive Manufacturing Technology Occupations for latest 12 months (Feb 2021 - Jan 2022) Silicon Valley Sub-Region**

| **Title** | **Silicon Valley** | **Title** | **Silicon Valley** |
| --- | --- | --- | --- |
| Maintenance Technician | 106 | Cnc Mill Operator | 8 |
| Cnc Operator | 35 | Senior Cnc Programmer | 8 |
| Cnc Programmer | 32 | Cnc Lathe Programmer | 7 |
| Automotive Maintenance Technician | 24 | Equipment Maintenance Engineer | 7 |
| Cnc Machine Operator | 23 | Machine Operator | 7 |
| Equipment Maintenance Technician | 21 | Maintenance & Store Sanitation Team Member | 7 |
| Manufacturing Engineering Technician | 15 | Maintenance Associate | 7 |
| General Maintenance Technician | 9 | Maintenance Technician II | 7 |
| Cnc Lathe Setup/Operator | 8 | Maintenance Worker | 7 |
| Source: Burning Glass |

## Industry Concentration

**Table 5. Industries hiring Additive Manufacturing Technology Workers in Bay Region**

| **Industry – 6 Digit NAICS (No. American Industry Classification) Codes** | **Jobs in Industry (2020)** | **Jobs in Industry (2025)** | **% Change (2020-25)** | **% Occupation Group in Industry (2020)** |
| --- | --- | --- | --- | --- |
| Machine Shops | 895 | 936 | 5% | 19% |
| Semiconductor and Related Device Manufacturing | 407 | 403 | -1% | 9% |
| Semiconductor Machinery Manufacturing | 253 | 295 | 17% | 6% |
| Electronic Computer Manufacturing | 164 | 181 | 11% | 3% |
| Surgical and Medical Instrument Manufacturing | 152 | 170 | 12% | 3% |
| Pharmaceutical Preparation Manufacturing | 135 | 132 | -2% | 3% |
| Printed Circuit Assembly (Electronic Assembly) Manufacturing | 99 | 111 | 12% | 2% |
| Guided Missile and Space Vehicle Manufacturing | 94 | 86 | -8% | 2% |
| Automobile Manufacturing | 70 | 114 | 63% | 2% |
| Other Electronic Component Manufacturing | 87 | 71 | -18% | 2% |
| Source: EMSI 2021.3 |

**Table 6. Top Employers Posting Additive Manufacturing Technology Occupations in Bay Region and Silicon Valley Sub-Region (Feb 2021 - Jan 2022)**

| **Employer** | **Bay** | **Employer** | **Silicon Valley** |
| --- | --- | --- | --- |
| Bridgestone / Firestone | 96 | Bridgestone / Firestone | 24 |
| Tesla | 83 | Western Digital | 22 |
| Amazon | 55 | TTM Technologies | 21 |
| Lucid Motors | 35 | Whole Foods Market, Inc. | 17 |
| Whole Foods Market | 34 | Danaher Corporation | 16 |
| Western Digital | 31 | Headway Technologies Incorporated | 15 |
| Jabil, Inc | 28 | Goodyear | 15 |
| Danaher Corporation | 28 | Professional Plastics | 13 |
| Goodyear | 26 | Pss | 10 |
| Sanmina Corporation | 23 | CNC Precision Machining | 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 Silicon Valley Sub-Region, there is one (1) community college (De Anza) that issued 5 awards 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 labor market gap in the Bay region with 544 annual openings for the Additive Manufacturing Technology occupational cluster and 10 annual (3-year average) awards for an annual undersupply of 534 students. In the Silicon Valley Sub-Region, there is also a gap with 231 annual openings and 5 annual (3-year average) awards for an annual undersupply of 226 students.

## Student Outcomes

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

| **Metric Outcomes** | **Bay All CTE Programs** | **De Anza All CTE Programs** | **State 0956.00** | **Bay 0956.00** | **Silicon Valley 0956.00** | **De Anza 0956.00** |
| --- | --- | --- | --- | --- | --- | --- |
| Students with a Job Closely Related to Their Field of Study | 74% | 76% | 78% | 82% | 82% | 80% |
| Median Annual Earnings for SWP Exiting Students | $48,138 | $45,015 | $49,188 | $60,026 | $66,334 | $66,069 |
| Median Change in Earnings for SWP Exiting Students | 23% | 28% | 43% | 50% | 32% | 20% |
| Exiting Students Who Attained the Living Wage | 52.% | 53% | 41% | 68% | 71% | 65% |
| Source: Launchboard Strong Workforce Program Median of 2018-20. |

## Skills and Education

**Table 9. Top Skills for Additive Manufacturing Technology Occupations in Bay Region (Feb 2021 - Jan 2022)**

| **Skill** | **Posting** | **Skill** | **Posting** |
| --- | --- | --- | --- |
| Repair | 2,060 | Lathes | 271 |
| Computer Numerical Control (CNC) | 990 | Forklift Operation | 269 |
| Predictive / Preventative Maintenance | 897 | Personal Protective Equipment (PPE) | 259 |
| Machining | 569 | Packaging | 244 |
| Cleaning | 563 | Occupational Health and Safety | 229 |
| Machinery | 559 | Industrial Operations Industry Knowledge | 226 |
| Hand Tools | 505 | Robotics | 217 |
| Equipment Maintenance | 456 | Machine Operation | 215 |
| Schematic Diagrams | 449 | Customer Service | 208 |
| Power Tools | 436 | Conveyor Systems | 207 |
| Scheduling | 411 | Mastercam | 203 |
| Welding | 297 | Calipers | 196 |
| Lifting Ability | 280 | Hydraulics | 184 |
| Electrical Systems | 272 | Micrometers | 175 |
| Source: Burning Glass |

**Table 10. Education Requirements for Additive Manufacturing Technology Occupations in Bay Region**

| **Education (minimum advertised)** | **Latest 12 Mos. Postings** | **Percent 12 Mos. Postings** |
| --- | --- | --- |
| High school or vocational training | 1,621 | 83% |
| Associate's degree | 156 | 8% |
| Bachelor's degree and higher | 179 | 9% |
| 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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