



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%

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)
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

College	Subregion	Associate	Certificate Low	Total
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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

Certification	Posting	Certification	Posting
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 CCCCCO 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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