



Labor Market Analysis for Program Recommendation Engineering Design Occupations Chabot College

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

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Recommendation

Based on all available data, there appears to be an “undersupply” of Engineering Design workers compared to the demand for this cluster of occupations in the Bay region and in the East Bay sub-region (Alameda, Contra Costa counties). There is a projected annual gap of about 555 students in the Bay region and 151 students in the East Bay Sub-Region.

Introduction

This report provides student outcomes data on employment and earnings for TOP 0901.00 - Engineering, General (requires Calculus) (Transfer) 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 Chabot College and in the region.

This report profiles Engineering Design Occupations in the 12 county Bay region and in the East Bay sub-region for a proposed new program at Chabot College.

- **Architectural and Civil Drafters (17-3011):** Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Use knowledge of building materials, engineering practices, and mathematics to complete drawings.
Entry-Level Educational Requirement: Associate’s degree
Training Requirement: None
Percentage of Community College Award Holders or Some Postsecondary Coursework: 52%
- **Electrical and Electronics Drafters (17-3012):** Prepare wiring diagrams, circuit board assembly diagrams, and layout drawings used for the manufacture, installation, or repair of electrical equipment.
Entry-Level Educational Requirement: Associate’s degree
Training Requirement: None
Percentage of Community College Award Holders or Some Postsecondary Coursework: 58%
- **Mechanical Drafters (17-3013):** Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.
Entry-Level Educational Requirement: Associate’s degree
Training Requirement: None
Percentage of Community College Award Holders or Some Postsecondary Coursework: 58%

- **Drafters, All Other (17-3019):** All drafters not listed separately.
Entry-Level Educational Requirement: Associate's degree
Training Requirement: None
Percentage of Community College Award Holders or Some Postsecondary Coursework: 58%
- **Electro-Mechanical and Mechatronics Technologists and Technicians (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: 51%

Occupational Demand

Table 1. Employment Outlook for Engineering Design Occupations in Bay Region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Architectural and Civil Drafters	3,652	3,796	144	4%	2,277	455	\$29	\$34
Electrical and Electronics Drafters	884	967	83	9%	512	102	\$31	\$39
Mechanical Drafters	1,164	1,212	47	4%	602	120	\$28	\$39
Drafters, All Other	431	424	-7	-2%	204	41	\$26	\$31
Electro-Mechanical and Mechatronics Technologists and Technicians	481	509	28	6%	278	56	\$21	\$30
Total	6,612	6,908	296	4%	3,873	774		

Source: Lightcast 2022.3

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 Engineering Design Occupations in East Bay Sub-region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Architectural and Civil Drafters	1,174	1,228	55	5%	740	148	\$26	\$33
Electrical and Electronics Drafters	164	181	17	11%	96	19	\$29	\$32
Mechanical Drafters	287	316	29	10%	169	34	\$25	\$34
Drafters, All Other	157	159	2	1%	76	15	\$24	\$30
Electro-Mechanical and Mechatronics Technologists and Technicians	155	163	8	5%	88	18	\$16	\$26
Total	1,937	2,047	110	6%	1,169	234		

Source: Lightcast 2022.3

East Bay Sub-Region includes: Alameda, 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 (Sept. 2022 - Aug. 2023)

Occupation	Bay Region	East Bay
Electro-Mechanical and Mechatronics Technologists and Technicians	969	393
Electrical and Electronics Drafters	839	100

Occupation	Bay Region	East Bay
Drafters, All Other	800	294
Mechanical Drafters	372	148
Architectural and Civil Drafters	155	65

Source: Lightcast

**Table 4a. Top Job Titles for Engineering Design Occupations for latest 12 months (Sept. 2022 - Aug. 2023)
Bay Region**

Title	Bay	Title	Bay
Calibration Technicians	117	CAD Designers	58
Analog Design Engineers	111	Robotics Technicians	51
CAD Engineers	110	Analog IC Design Engineers	50
Instrument Technicians	94	Electromechanical Assemblers	49
Electronics Technicians	89	Instrumentation Technicians	49
Mechanical Designers	76	PCB Designers	41
CAD Drafters	74	Methodologists	31
Electrical Designers	68	Electromechanical Technicians	29
Drafters	66	Rework Technicians	29

Source: Lightcast

**Table 4b. Top Job Titles for Engineering Design Occupations for latest 12 months (Sept. 2022 - Aug. 2023)
East Bay Sub-Region**

Title	East Bay	Title	East Bay
Electromechanical Assemblers	39	Instrumentation Technicians	19
Calibration Technicians	38	Automation Technicians	15
Electronics Technicians	34	Electromechanical Technicians	15
Drafters	33	Piping Designers	15
CAD Drafters	31	Electrical Designers	14
Mechanical Designers	30	CAD Technicians	13
Instrument Technicians	26	Designers/Drafters	12
Robotics Technicians	25	Rework Operators	12
CAD Designers	23	Detailers	11

Source: Lightcast

Industry Concentration

Table 5. Industries hiring Engineering Design Workers in Bay Region

Industry - 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2021)	Jobs in Industry (2026)	% Change (2021-26)	% Occupation Group in Industry (2022)
Engineering Services	1,618	1,738	7%	23%
Architectural Services	1,217	1,120	-8%	15%
Landscape Architectural Services	262	242	-7%	3%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	149	236	58%	3%
Plumbing, Heating, and Air-Conditioning Contractors	161	191	18%	3%
Semiconductor Machinery Manufacturing	146	164	12%	2%
Electrical Contractors and Other Wiring Installation Contractors	149	165	11%	2%
Research and Development in Biotechnology (except Nanobiotechnology)	97	178	83%	2%
Semiconductor and Related Device Manufacturing	137	146	6%	2%
Electronic Computer Manufacturing	147	153	4%	2%

Source: Lightcast 2022.3

Table 6. Top Employers Posting Engineering Design Occupations in Bay Region and East Bay Sub-Region (Sept. 2022 - Aug. 2023)

Employer	Bay	Employer	East Bay
Apple	98	Randstad	33
Actalent	70	Actalent	27
Randstad	64	Tesla	26
GPAC	52	Lawrence Livermore National Laboratory	21
Tesla	37	GPAC	17
Synopsys	25	Hargrove Engineers + Constructors	17

Source: Lightcast

Educational Supply

There are 20 community colleges in the Bay Region issuing 219 awards on average annually (last 3 years ending 2021-22) on TOP 0901.00 - Engineering, General (requires Calculus) (Transfer). In the East Bay Sub-Region, there are six (6) community colleges that issued 83 awards on average annually (last 3 years) on this TOP code.

Table 7. Community College Awards on TOP 0901.00 - Engineering, General (requires Calculus) (Transfer) in Bay Region

College	Subregion	Associate Degree	High unit Certificate	Low unit Certificate	Total
Cabrillo	SC-Monterey	24	0	0	24
Canada	Mid-Peninsula	9	2	0	11
Chabot	East Bay	8	0	3	11
Contra Costa	East Bay	3	0	4	7
Diablo Valley	East Bay	18	0	0	18
Evergreen Valley	Silicon Valley	1	0	0	1
Foothill	Silicon Valley	9	0	0	9
Gavilan	Silicon Valley	3	0	0	3
Hartnell	SC-Monterey	13	0	3	16
Las Positas	East Bay	3	0	0	3
Los Medanos	East Bay	8	0	0	8
Mission	Silicon Valley	13	0	0	13
Monterey	SC-Monterey	7	2	1	10
Ohlone	East Bay	3	0	33	36
San Francisco	Mid-Peninsula	6	0	0	6
San Mateo	Mid-Peninsula	10	0	0	10
Santa Rosa	North Bay	21	0	0	21
Skyline	Mid-Peninsula	3	0	0	3
Solano	North Bay	7	0	0	7
West Valley	Silicon Valley	2	0	0	2
Total		171	4	44	219

Source: Data Mart

Note: The annual average for awards is 2019-20 to 2021-22.

Gap Analysis

Based on the data included in this report, there is a labor market gap in the Bay region with 774 annual openings for the Engineering Design occupational cluster and 219 annual (3-year average) awards for an annual undersupply of 555 students. In the East Bay Sub-Region, there is also a gap with 234 annual openings and 83 annual (3-year average) awards for an annual undersupply of 151 students.

Student Outcomes

Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0901.00 - Engineering, General (requires Calculus) (Transfer)

Metric Outcomes	Bay All CTE Programs	Chabot All CTE Programs	State 0901.00	Bay 0901.00	East Bay 0901.00	Chabot 0901.00
Students with a Job Closely Related to Their Field of Study	74%	75%	69%	67%	75%	N/A
Median Annual Earnings for Exiting Students	\$53,090	\$48,800	\$31,334	\$35,912	\$36,712	\$38,142
Median Change in Earnings for Exiting Students	24%	34%	44%	48%	36%	64%
Exiting Students Who Attained the Living Wage	54%	56%	39%	35%	42%	47%

Source: CCCC Launchboard (2018-19 – 2019-20)

Skills, Certifications and Education

Table 9. Top Skills for Engineering Design Occupations in Bay Region (Sept. 2022 - Aug. 2023)

Skill	Posting	Skill	Posting
Computer-Aided Design	782	Electromechanics	250
AutoCAD	615	Simulations	240
Electrical Engineering	443	Printed Circuit Board	235
Automation	310	Mechanical Engineering	229
Debugging	310	3D Modeling	220
Project Management	306	Calibration	213
Python (Programming Language)	297	Scripting	206
Autodesk Revit	268	Instrumentation	199
Test Equipment	263	Circuit Design	197
Electronics	259	Oscilloscope	197

Source: Lightcast

Table 10. Certifications for Engineering Design Occupations in Bay Region (Sept. 2022 - Aug. 2023)

Certification	Posting	Certification	Posting
Valid Driver's License	216	Transportation Worker Identification Credential (TWIC) Card	20
Enterprise Desktop Administrator (Microsoft Certified IT Professional)	180	CDL Class C License	17
Security Clearance	87	LEED Accredited Professional (AP)	16
Engineer in Training	20	Secret Clearance	15
Certified Loss Control Specialist	20	Professional Engineer (PE) License	13

Source: Lightcast

Table 11. Education Requirements for Engineering Design Occupations in Bay Region

Education Level	Job Postings	% of Total
High school or GED	418	16%
Associate degree	568	22%
Bachelor's degree & higher	1,619	62%

Source: Lightcast

Note: 41% of records have been excluded because they do not include a degree level. As a result, the chart above may not be representative of the full sample.

Methodology

Occupations for this report were identified by use of job descriptions and skills listed in O*Net. Labor demand data is sourced from Lightcast occupation and job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CCCC Data Mart and CTE Launchboard.

Sources

O*Net Online

Lightcast

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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