Engineering Technology Occupations
Labor Market Information Report
Ohlone 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 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 Counties). There is a projected annual gap of about 1,352 students in the Bay region and 300 students in the East Bay Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0924.00 - Engineering Technology, General (requires Trigonometry) and TOP 0956.00 Manufacturing and Industrial Technology 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 Ohlone College and in the region.

Introduction

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

- **Electrical and Electronics Engineering Technicians (SOC 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: 53%

- **Engineering Technicians, Except Drafters, All Other (SOC 17-3029):** 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: 53%

- **Industrial Engineering Technicians (SOC 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: 53%

- **Mechanical Engineering Technicians (SOC 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: 53%

Occupational Demand

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

Occupation	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	5-Yr Open-ings	Average Annual Open-ings	10% Hourly Wage	Median Hourly Wage
Electrical and Electronics Engineering Technicians	9,311	9,480	169	2%	4,238	848	$23.14	$30.69
Engineering Technicians, Except Drafters, All Other	3,006	3,181	175	6%	1,486	297	$25.71	$33.49
Industrial Engineering Technicians	1,073	1,202	129	12%	611	122	$20.97	$28.58
Mechanical Engineering Technicians	993	1,091	98	10%	539	108	$22.05	$28.55
Total	**14,383**	**14,953**	**570**	**4%**	**6,874**	**1,375**	**$23.44**	**$30.97**

Source: EMSI 2019.3
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 Technology Occupations in East Bay Sub-Region

Occupation	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	5-Yr Open-ings	Average Annual Open-ings	10% Hourly Wage	Median Hourly Wage
Electrical and Electronics Engineering Technicians	1,774	1,830	55	3%	824	165	$21.28	$28.26
Engineering Technicians, Except Drafters, All Other	756	806	50	7%	380	76	$25.08	$32.57
Industrial Engineering Technicians	284	325	40	14%	169	34	$16.79	$25.89
Mechanical Engineering Technicians	290	326	35	12%	165	33	$21.49	$25.89
TOTAL	**3,105**	**3,286**	**181**	**6%**	**1,538**	**308**	**$21.81**	**$28.87**

Source: EMSI 2019.3
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 (January 2019 - December 2019)

Occupation	Bay Region	East Bay
Engineering Technicians, Except Drafters, All Other	2,571	556
Manufacturing Production Technicians	2,324	910
Industrial Engineering Technicians	2,193	852
Electronics Engineering Technicians	1,664	572
Mechanical Engineering Technicians	488	180
Mechanical Engineering Technologists	144	32
Electrical Engineering Technicians	94	46
Non-Destructive Testing Specialists	78	18
Photonics Technicians	73	27
Industrial Engineering Technologists	64	9
Electronics Engineering Technologists	44	38
Nanotechnology Engineering Technicians	36	19
Electrical Engineering Technologists	13	0

Occupation	Bay Region	East Bay
Manufacturing Engineering Technologists	8	6
Total	**9,794**	**3,265**

Source: Burning Glass

Table 4a. Top Job Titles for Engineering Technology Occupations for latest 12 months (January 2019 - December 2019) Bay Region

Common Title	Bay	Common Title	Bay
Manufacturing Technician	1,184	Test Operator	93
Maintenance Technician	1,116	Mechanical Inspector	93
Engineering Technician	874	Electromechanical Technician	82
Production Technician	492	Technician	78
Test Technician	416	Technical Solutions Engineer	73
Maintenance Worker	305	Manufacturing Specialist	64
Engineer	292	Maintenance Sanitation Team Member, Retail Industry	64
Electronics Technician	268	Cable Technician	44
Electrical Technician	243	Laboratory Technician	42
Mechanical Technician	231	Low Voltage Technician	38
Operations Technician	163	Systems Engineer	37
Process Technician	151	Engineering Analyst	37
Maintenance Engineer	132	Automation Technician	37
Senior Engineer	102	Lead Engineer	35

Table 4b. Top Job Titles for Engineering Technology Occupations for latest 12 months (January 2019 - December 2019) East Bay Sub-Region

Common Title	East Bay	Common Title	East Bay
Manufacturing Technician	509	Test Operator	36
Maintenance Technician	475	Operations Technician	36
Engineering Technician	264	Technician	26
Production Technician	192	Manufacturing Specialist	23
Electrical Technician	125	Automation Technician	18
Electronics Technician	91	Low Voltage Technician	17
Maintenance Worker	89	Maintenance Mechanic	16
Test Technician	84	Cleanroom Technician	16
Engineer	82	Cable Technician	15
Process Technician	75	Senior Engineer	14
Mechanical Technician	70	Industrial Technician	14
Mechanical Inspector	41	Mechanic	13
Maintenance Engineer	41	Maintenance Sanitation Team Member, Retail Industry	13
Electromechanical Technician	37	Electronics Technologist	13

Source: Burning Glass

Industry Concentration

Table 5. Industries hiring Engineering Technology Workers in Bay Region

Industry – 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2018)	Jobs in Industry (2022)	% Change (2018-22)	% in Industry (2018)
Semiconductor and Related Device Manufacturing (334413)	2,194	2,053	-6%	15%
Electronic Computer Manufacturing (334111)	1,475	1,616	10%	10%
Engineering Services (541330)	1,043	1,138	9%	7%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715)	734	808	10%	5%

Custom Computer Programming Services (541511)	486	560	15%	3%
Other Electronic Component Manufacturing (334419)	449	375	-16%	3%
Research and Development in Biotechnology (except Nanobiotechnology) (541714)	432	591	37%	3%
Testing Laboratories (541380)	413	420	2%	3%
Printed Circuit Assembly (Electronic Assembly) Manufacturing (334418)	408	479	17%	3%
Federal Government, Civilian, Excluding Postal Service (901199)	328	322	-2%	2%
Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals (334515)	327	310	-5%	2%
Bare Printed Circuit Board Manufacturing (334412)	300	248	-17%	2%
Computer Systems Design Services (541512)	289	319	10%	2%
Local Government, Excluding Education and Hospitals (903999)	231	243	5%	2%
Temporary Help Services (561320)	229	244	7%	2%
Analytical Laboratory Instrument Manufacturing (334516)	212	204	-4%	1%
Electromedical and Electrotherapeutic Apparatus Manufacturing (334510)	201	240	19%	1%
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing (334220)	204	165	-19%	1%
US Postal Service (901149)	185	155	-16%	1%
Semiconductor Machinery Manufacturing (333242)	172	194	13%	1%
Corporate, Subsidiary, and Regional Managing Offices (551114)	175	182	4%	1%
Other Measuring and Controlling Device Manufacturing (334519)	153	182	19%	1%

Source: EMSI 2019.3

Table 6. Top Employers Posting Engineering Technology Occupations in Bay Region and East Bay Sub-Region (January 2019 - December 2019)

Employer	Bay	Employer	Bay	Employer	East Bay
Western Digital	123	Intel Corporation	26	Tesla	64
Whole Foods Market, Inc.	116	Formfactor, Inc	26	Lawrence Livermore National Laboratory	52
Tesla	90	Integrated Resources Incorporated	24	Whole Foods Market, Inc.	31
Google Inc.	75	Deloitte	24	Tesla Motors	24
Apple Inc.	70	Varian Medical Systems	23	Finisar Corporation	24
Applied Materials	62	Tekberry	23	Western Digital	22
Lawrence Livermore National Laboratory	52	General Dynamics	23	Formfactor, Inc	20
Thermo Fisher Scientific Inc	51	Facebook	23	Valassis	19
Genentech	43	Tellus Solutions	22	Nana Regional Corporation	19
Cisco Systems Incorporated	42	Milestone Technologies Incorporated	22	Intarcia Therapeutics, Inc.	19
Outsource	38	Army National Guard	22	Sandia Corporation	18
Tesla Motors	37	Joby Aviation	20	Boehringer Ingelheim	18
Nvidia Corporation	29	Enterprise Rent-A-Car	20	PepsiCo Inc.	17
Finisar Corporation	28	Valassis	19	Thermo Fisher Scientific Inc	16
Sanmina Corporation	27	Nana Regional Corporation	19	Outsource	16
Pacific Gas and Electric Company	27	KLA-Tencor	19	Lucid Motors Inc	16
Jones Lang Lasalle Incorporated	26	Intarcia Therapeutics, Inc.	19	Integrated Resources Incorporated	16

Source: Burning Glass

Educational Supply

There are three (3) community colleges in the Bay Region issuing 18 awards on average annually (last 3 years) on TOP 0924.00 - Engineering Technology, General (requires Trigonometry). There is one college (Ohlone) in the East Bay Sub-Region issuing 8 awards on average annually (last 3 years) on this TOP code. There are two (2) community colleges in the Bay Region issuing 5 awards on average annually (last 3 years) on TOP 0956.00 - Manufacturing and Industrial Technology. There are no colleges in the East Bay Sub-Region issuing awards on average annually (last 3 years) on this TOP code.

Table 7. Awards on TOP 0924.00 - Engineering Technology, General (requires Trigonometry) and TOP 0956.00 Manufacturing and Industrial Technology - in Bay Region

College	Sub-Region	TOP Code	Associates	Certificate 18+ units	Certificate Low unit	Total
Cabrillo College	Santa Cruz - Monterey	0924.00	1	1	7	9
City College of San Francisco	Mid-Peninsula	0924.00	1			1
Ohlone College	East Bay	0924.00	8			8
City College of San Francisco	Mid-Peninsula	0956.00		1		1
De Anza College	Silicon Valley	0956.00	3	1		4
Total Bay Region			**13**	**3**	**7**	**23**
Total East Bay Sub-Region			**8**	**0**	**0**	**8**

Source: Data Mart

Note: The annual average for awards is 2015-16 to 2017-18.

Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 1,375 annual openings for the Engineering Technology occupational cluster and 23 annual (3-year average) awards on the two TOP codes (see Table 7) for an annual undersupply of 1,352 students. In the East Bay Sub-Region, there is also a gap with 308 annual openings and 8 annual (3-year average) awards on the two TOP codes for an annual undersupply of 300 students.

Student Outcomes

Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0924.00 - Engineering Technology, General (requires Trigonometry)

2015-16	Bay (All CTE Programs)	Ohlone College (All CTE Programs)	State (0924.00)	Bay (0924.00)	East Bay (0924.00)	Ohlone College (0924.00)
% Employed Four Quarters After Exit	74%	75%	52%	63%	n/a	n/a
Median Quarterly Earnings Two Quarters After Exit	$10,550	$10,000	$8,130	$8,190	n/a	n/a
Median % Change in Earnings	46%	28%	69%	59%	n/a	n/a
% of Students Earning a Living Wage	63%	64%	52%	53%	n/a	n/a

Source: Launchboard Pipeline (version available on 1/13/20)

Skills, Certifications and Education

Table 9. Top Skills for Engineering Technology Occupations in Bay Region (January 2019 - December 2019)

Skill	Postings	Skill	Postings	Skill	Postings
Repair	2,966	Manufacturing Processes	564	Current Good Manufacturing Practices (CGMP)	361
Test Equipment	1,087	Lifting Ability	563	Manual Dexterity	359
Hand Tools	987	Wiring	556	Biotechnology	346
Predictive / Preventative Maintenance	928	Python	492	Forklift Operation	325
Scheduling	898	Linux	485	Occupational Health and Safety	313
Schematic Diagrams	808	Electronics Industry Knowledge	484	Electrical Diagrams / Schematics	310

Cleaning	776	Packaging	477	Calculation	302
Technical Support	748	Good Manufacturing Practices (GMP)	476	Robotics	291
Quality Assurance & Control	711	Microscope	434	Spreadsheets	291
Soldering	666	Welding	424	Debugging	287
Customer Service	659	Project Management	406	Process Improvement	283
Machinery	649	Data Entry	403	SAP	277
Calibration	636	Basic Mathematics	382	Power Supplies	268
Power Tools	615	Experiments	367	5S Methodology	267
Oscilloscopes	568	Equipment Maintenance	365	Customer Contact	262

Source: Burning Glass

Table 10. Certifications for Engineering Technology Occupations in Bay Region (January 2019 - December 2019)

Note: 80% 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
Driver's License	1,168	IT Infrastructure Library (ITIL) Certification	28
Security Clearance	140	Certified Meeting Planner	28
Forklift Operator Certification	73	CDL Class A	27
CDL Class C	63	IPC Certification	24
Biotechnology Certificate	54	Leadership In Energy And Environmental Design (LEED) Certified	22
Automotive Service Excellence (ASE) Certification	46	The American Society For Nondestructive Testing (ASNT) Certification	21
Cisco Certified Network Professional (CCNP)	40	Soldering Certification	20
Cisco Certified Network Associate (CCNA)	40	Certified Information Systems Security Professional (CISSP)	20
Cisco Certified Internetwork Expert (CCIE)	37	Licensed Professional Engineer	19
Certified A+ Technician	37	ITIL Certification	19
Welding Certification	32	Electrician Certification	17
Airframe and Powerplant (A and P) Certification	31	Certified Electronics Technician Associate	17

Source: Burning Glass

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

Note: 43% 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	Percent 12 Mos. Postings
High school or vocational training	2,728	49%
Associate Degree	939	17%
Bachelor's Degree or Higher	1,670	34%

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

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