



Engineering Technicians

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Prepared by the South Central Coast Region Center of Excellence for Labor Market Research

Occupation Codes and Descriptions

Currently, there are six occupations in the standard occupational classification (SOC) system related to the study of engineering technicians. The occupation titles and descriptions, as well as reported job titles are included in Exhibit 1.

Exhibit 1 – Occupations, descriptions and sample job titles

SOC Code	Title	Description	Sample of Reported Job Titles
17-3021	Aerospace Engineering and Operations Technicians	Operate, install, calibrate, and maintain integrated computer/communications systems, consoles, simulators, and other data acquisition, test, and measurement instruments and equipment, which are used to launch, track, position, and evaluate air and space vehicles. May record and interpret test data.	Avionics Technician, Avionics Test Technician, Calibration Technician, Communication Technician, Electronics Technician, Engineering Technician, Instrumentation Technician, Spacecraft Systems Engineer, Systems Test Technician, Test Technician
17-3022	Civil Engineering Technicians	Apply theory and principles of civil engineering in planning, designing, and overseeing construction and maintenance of structures and facilities under the direction of engineering staff or physical scientists.	Civil Designer, Civil Engineering Assistant, Civil Engineering Designer, Civil Engineering Technician, Design Technician, Engineer Technician, Engineering Assistant, Engineering Specialist, Engineering Technician, Transportation Engineering Technician
17-3023	Electrical and Electronics Engineering Technicians	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.	Digital Technician, Electrical Technician, Electronics Engineering Technician, Electronics Technician, Engineering Technician, Failure Analysis Technician, Generation Technician, Instrument and Controls Technician, Refurbish Technician, Relay Tester, Senior Electronics Technician, Technician, Test Technician

17-3024	Electro-Mechanical Technicians	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.	Electro-Mechanic, Electro-Mechanical Technician (E/M Technician), Electronic Technician, Engineering Technician, Laboratory Technician (Lab Technician), Maintenance Technician, Mechanical Technician, Product Test Specialist, Test Technician, Tester
17-3026	Industrial Engineering Technicians	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.	Engineering Technician, Industrial Engineering Analyst, Industrial Engineering Technician, Manufacturing Technician, Methods Engineer, Process Documentation and Methods Analyst, Process Engineer, Process Technician, Production Staff Worker, Quality Control Engineering Technician (QC Engineering Technician)
17-3027	Mechanical Engineering Technicians	Apply theory and principles of mechanical engineering to modify, develop, test, or calibrate machinery and equipment under direction of engineering staff or physical scientists.	Design Engineer, Designer, Engineering Lab Technician, Engineering Technical Analyst, Engineering Technician, Equipment Engineer, Lab Technician, Mechanical Designer, Process Technician, Research and Development Technician

Source: O*NET Online

Current and Future Employment

In the South Central Coast Region¹, the number of engineering technicians is expected to decrease by 3% over the next five years. More than 70 job opportunities will be available annually for engineering technicians through 2021 due to replacement needs (e.g., retirements). Exhibit 2 contains detailed employment projections data for these occupations.

Exhibit 2 – Five-year projections for Engineering Technicians in the South Central Coast Region

SOC	Occupation	2016 Jobs	2021 Jobs	2016 - 2021 Change	2016 - 2021 % Change	Annual Openings
17-3021	Aerospace Engineering and Operations Technicians	124	125	1	1%	4
17-3022	Civil Engineering Technicians	460	458	(2)	(0%)	12
17-3023	Electrical and Electronics Engineering Technicians	1,454	1,374	(80)	(6%)	38
17-3024	Electro-Mechanical Technicians	107	104	(3)	(3%)	3
17-3026	Industrial Engineering Technicians	173	183	10	6%	7
17-3027	Mechanical Engineering Technicians	338	332	(6)	(2%)	10
		2,656	2,576	(80)	(3%)	75

Source: Economic Modeling Specialists International (EMSI)

¹ The South Central Coast Region consists of San Luis Obispo County, Santa Barbara County, Ventura County, and the following cities from North Los Angeles County: Canyon Country, Castaic, Lake Hughes, Lancaster, Littlerock, Llano, Newhall, Palmdale, Pearblossom, Santa Clarita, Stevenson Ranch, and Valencia.

Earnings

The average entry-level earnings for the cluster of occupations studied below is \$18.29 per hour, which is above the MIT Living Wage² estimate for a single adult in the counties that make up the South Central Coast Region:

- Los Angeles County living wage: \$13.08/hour
- San Luis Obispo County living wage: \$12.54/hour
- Santa Barbara County living wage: \$13.85/hour
- Ventura County living wage: \$13.39/hour

Exhibit 3 contains hourly wages and annual average earnings for engineering technicians. Entry-level hourly earnings is represented by the 10th percentile of wages, median hourly earnings is represented by the 50th percentile of wages, and experienced hourly earnings is represented by the 90th percentile of wages, demonstrating various levels of employment.

Exhibit 3 – Earnings for Engineering Technicians in the South Central Coast Region, 2016-2021

SOC	Occupation	Entry-Level Hourly Earnings	Median Hourly Earnings	Experienced Hourly Earnings	Average Annual Earnings
17-3021	Aerospace Engineering and Operations Technicians	\$24.73	\$36.43	\$50.18	\$76,380
17-3022	Civil Engineering Technicians	\$19.93	\$32.51	\$43.47	\$66,070
17-3023	Electrical and Electronics Engineering Technicians	\$17.87	\$31.67	\$48.85	\$67,222
17-3024	Electro-Mechanical Technicians	\$16.69	\$25.78	\$42.23	\$56,978
17-3026	Industrial Engineering Technicians	\$18.32	\$27.60	\$47.91	\$63,158
17-3027	Mechanical Engineering Technicians	\$16.06	\$24.63	\$38.19	\$53,396
		\$18.29	\$30.64	\$46.29	\$65,000

Source: Economic Modeling Specialists International (EMSI)

² MIT Living Wage Calculator. <http://livingwage.mit.edu/>

Employer Job Postings

To identify job postings related to engineering technicians, the following keywords/search terms and occupation codes were used: aerospace engineering and operations technicians (17-3021), civil engineering technicians (17-3022), electrical and electronics engineering technicians (17-3023), electro-mechanical technicians (17-3024), industrial engineering technicians (17-3026), and mechanical engineering technicians (17-3027).

Top Occupations

In 2016, there were 412 employer postings for engineering technicians in the South Central Coast Region. Roughly two-thirds of the postings (67%) were for electronics engineering technicians with 278 postings. There were 522 job postings for engineering technicians in 2015, and 348 job postings in 2014.

Exhibit 4 – Top occupations in job postings (n=412)

SOC Code	Occupation	Job Postings, Full Year 2016
17-3023	Electrical And Electronics Engineering Technicians	279
17-3022	Civil Engineering Technicians	78
17-3027	Mechanical Engineering Technicians	38
17-3024	Electro-Mechanical Technicians	9
17-3021	Aerospace Engineering and Operations Technicians	6
17-3026	Industrial Engineering Technicians	2

Source: Labor Insight/Jobs (Burning Glass)

Top Titles

The top job titles for employers posting ads for engineering technicians are listed in exhibit 5. Test technician is mentioned as the job title in 26% of all relevant job postings (109 postings).

Exhibit 5 –Job titles (n=412)

Title	Job Postings, Full Year 2016
Test Technician	109
Engineering Technician	104
Electronics Technician	78
Mechanical Technician	26
Instrumentation Technician	23

Source: Labor Insight/Jobs (Burning Glass)

Top Employers

Exhibit 6 lists the major employers hiring professionals in the field of engineering technicians. Top employers posting job ads included: JT3, Skyworks Solutions Incorporated, Lockheed Martin Corporation, Alliant Techsystems, and Northrop Grumman. The top worksite cities in the region for these occupations were Camarillo, Oxnard, Goleta, and Thousand Oaks.

Exhibit 6 – Top employers (n=93)

Employer	Job Postings, Full Year 2016
JT3, LLC	14
Skyworks Solutions Incorporated	13
Lockheed Martin Corporation	10
Alliant Techsystems	9
Northrop Grumman	9

Source: Labor Insight/Jobs (Burning Glass)

Top Skills

Job-specific skills desired by employers include test equipment, repair, Microsoft excel, schematic diagrams, oscilloscopes, soldering, inspection, calibration, Microsoft office, and hand tools.

Exhibit 7 –Job skills (n=352)

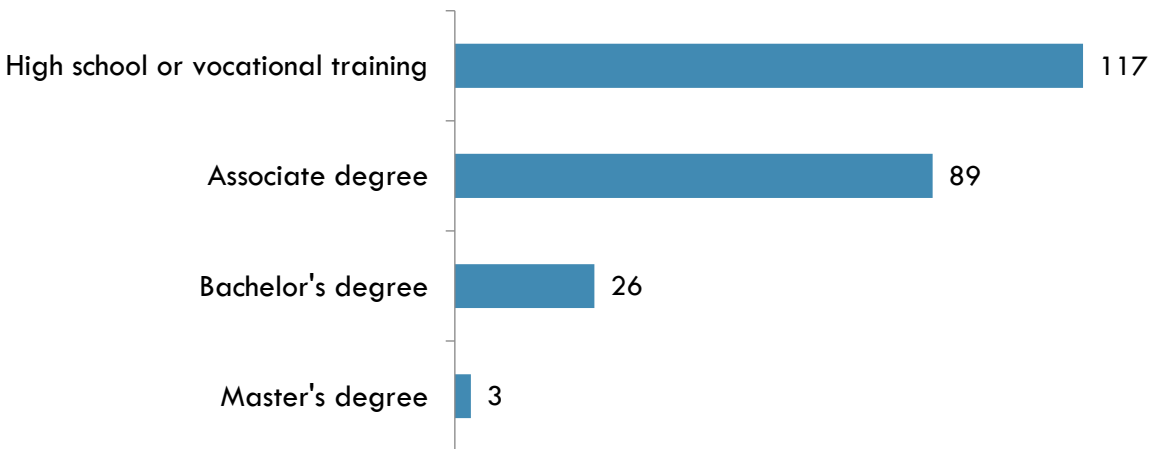
Skills	Job Postings, Full Year 2016	Skills	Job Postings, Full Year 2016
Test Equipment	127	Soldering	76
Repair	122	Inspection	73
Microsoft Excel	81	Calibration	69
Schematic Diagrams	81	Microsoft Office	61
Oscilloscopes	76	Hand Tools	56

Source: Labor Insight/Jobs (Burning Glass)

Advertised Education Levels

Exhibit 8 displays the education level requested by employers in online job ads. The majority of employers were looking for a candidate with at least high school or vocational training. Approximately 43% of job postings did not specify a level of education.

Exhibit 8 – 2016 Online job ads with minimum advertised education requirements for Engineering Technicians (n=235)



Source: Labor Insight/Jobs (Burning Glass)

Industry Concentration

Engineering technician jobs in the South Central Coast Region are most often found in the engineering services industry (16% of total jobs in the industry). Exhibit 9 shows the industries that employ the most engineering technicians in the South Central Coast Region.

Exhibit 9 – Industries employing the most engineering technicians, 2016

NAICS (6-Digit)	Industry	Occupation Group Jobs in Industry (2016)	% of Occupation Group in Industry (2016)
541330	Engineering Services	432	16%
903999	Local Government, Excluding Education and Hospitals	204	8%
334413	Semiconductor and Related Device Manufacturing	185	7%

336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	135	5%
902999	State Government, Excluding Education and Hospitals	107	4%

Education and Training

Exhibit 10 shows the typical entry-level education requirement for the occupations of interest, along with the typical on-the-job training, and percentage of workers in the field who hold a community college award or have completed some postsecondary courses.

Exhibit 10 – Education and training requirements (2015-2020)

SOC	Occupation	Typical entry-level education	Typical on-the-job training	% of Community College Award Holders or Some Postsecondary Coursework
17-3021	Aerospace Engineering and Operations Technicians	Associate degree	None	55%
17-3022	Civil Engineering Technicians	Associate degree	None	55%
17-3023	Electrical and Electronics Engineering Technicians	Associate degree	None	55%
17-3024	Electro-Mechanical Technicians	Associate degree	None	55%
17-3026	Industrial Engineering Technicians	Associate degree	None	55%
17-3027	Mechanical Engineering Technicians	Associate degree	None	55%

Source: Economic Modeling Specialists International, Bureau of Labor Statistics Employment Projections (Educational Attainment)

Currently, there are seven community colleges in the South Central Coast Region that train students in programs related to the field of engineering technicians. Exhibit 11 displays the headcount and annual average community college awards for each of the colleges training in this field. Headcount is the actual number of students enrolled, regardless of credit hours. It is also important to note that an award is not equivalent to a single person in search of a job opening, since a student may earn more than one award (e.g. an associate degree and a certificate).

Between 2012-2015, the total annual average community college awards conferred was four (three associate degrees and one certificate) across the program: Engineering Technology, General (0924.00).

Exhibit 11 – CCC Student Awards (by TOP and College)

TOP Code	Program	College	2012 – 2015 Annual Average			Total Average CC Awards
			CCC Headcount	CCC Associate Degrees	CCC Certificates	
0924.00	Engineering Technology, General	Allan Hancock	112	1	-	1
		Antelope Valley	2	1	1	2
		Canyons	119	-	-	-
		Cuesta	156	-	-	-
		Moorpark	142	-	-	-
		Santa Barbara	81	-	-	-
		Ventura	-	1	-	1
			612	3	1	4

Source: California Community Colleges Chancellor’s Office MIS Data Mart

Student Outcomes

The CTE LaunchBoard provides student outcome data on the effectiveness of the following CTE program. The student outcome information below was collected from exiters of the Engineering Technology, General program (TOP code 0924.00) in the South Central Coast Region for the 2013-2014 academic year:

- 34% of students are earning a living wage
- 53% of students are employed within six months after completing a program

Source: CTE LaunchBoard

Sources

O*Net Online, Labor Insight/Jobs (Burning Glass), Economic Modeling Specialists International (EMSI), MIT Living Wage Calculator, Bureau of Labor Statistics (BLS) Education Attainment, California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart, CTE LaunchBoard, Statewide CTE Outcomes Survey, Employment Development Department Unemployment Insurance Dataset

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Notes

Data included in this analysis represents the labor market demand for positions most closely related to engineering technicians. Standard occupational classification (SOC) codes were chosen based on the national education level required for employment (associate degree and postsecondary certificate) as well as the proportion of current workers who hold a community college award or have had some community college training. This selection process narrows the labor market analysis to the most relevant employment opportunities for students with community college education and/or training.

Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study and should not be used to establish current job openings, because the numbers may include duplicate job postings or postings intended to gather a pool of applicants. Real-time labor market information can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.