

Program Endorsement Brief: 0924.00/Engineering Technology, General Engineering Technology

Orange County Center of Excellence, October 2020

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some Criteria Met <input type="checkbox"/>	Not Endorsed <input type="checkbox"/>
Program Endorsement Criteria			
Supply Gap:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Living Wage: (Entry-Level, 25th)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Education:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Emerging Occupation(s)			
Yes <input type="checkbox"/>		No <input checked="" type="checkbox"/>	

The Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to four middle-skill occupations: *electrical and electronic engineering technologists and technicians (17-3023)*, *industrial engineering technologists and technicians (17-3026)*, *mechanical engineering technologists and technicians (17-3027)*, and *calibration technologists and technicians and engineering technologists and technicians, except drafters, all other (17-3098)*. Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.¹ This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for engineering technology occupations in the region. Furthermore, the Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for these occupations and entry-level wages exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to all the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

Demand:

- **Supply Gap Criteria** – Over the next five years, there is projected to be **1,230 jobs available annually** in the region due to new job growth and replacements, **which is more than the 219 awards conferred annually** by educational institutions in the region.

¹ The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

- **Living Wage Criteria** –Within Orange County, **all of the annual job openings** for engineering technology occupations have **entry-level wages above the county’s living wage** (\$17.36/hour).²
- **Educational Criteria** –The Bureau of Labor Statistics (BLS) lists an **associate degree as the typical entry-level education** for these engineering technology occupations.
 - Furthermore, the national-level educational attainment data indicates **53.5% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **4 community colleges** in the LA/OC region that issue awards related to program/occupation name, conferring an average of **192 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **27 awards conferred annually** in related training programs by non-community college institutions throughout the region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for engineering technology occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 1% through 2024. However, there will be more than 1,200 job openings per year through 2024 due to retirements and workers leaving the field.

This report includes employment projection data by Emsi which uses EDD information. Emsi’s projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	7,882	7,753	(129)	(2%)	779
Orange	4,464	4,523	59	1%	451
Total	12,346	12,276	(70)	(1%)	1,230

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these engineering technology occupations in Orange County as they relate to the county’s living wage.

² Living wage data was pulled from California Family Needs Calculator on 10/26/2020. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

³ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

Orange County— All of the annual openings for engineering technology occupations have entry-level wages above the living wage for one adult (\$17.36 in Los Angeles County).⁴ Typical entry-level hourly wages are in a range between \$23.49 and \$25.94. Experienced workers can expect to earn wages between \$39.94 and \$43.12, which are higher than the living wage estimate. Orange County's average wages are below the average statewide wage of \$33.44 for these occupations.

Los Angeles County— All of the annual openings for engineering technology occupations have entry-level wages above the living wage for one adult (\$15.04 in Los Angeles County).⁵ Typical entry-level hourly wages are in a range between \$22.45 and \$25.37. Experienced workers can expect to earn wages between \$39.05 and \$40.84, which are higher than the living wage estimate. Los Angeles County's average wages are below the average statewide wage of \$33.44 for these occupations.

Job Postings

There were 7,318 online job postings related to engineering technology listed in the past 12 months. The highest number of job postings were for maintenance technicians, test technicians, manufacturing technicians, engineering technicians, and production technicians. The top skills were: repair, predictive/preventative maintenance, machinery, test equipment, and schematic designs. The top three employers, by number of job postings, in the region were: Northrop Grumman, Goodyear, and Orange County Sanitation District.

It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.

Educational Attainment

The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for engineering technology occupations. Furthermore, the national-level educational attainment data indicates 53.5% of workers in the field have completed some college or an associate degree. Of the 51% of engineering technology job postings listing a minimum education requirement in Los Angeles/Orange County, 83% (3,136) requested a high school diploma and 17% (622) requested an associate degree.

Educational Supply

Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP code: Engineering Technology, General (0924.00). The colleges with the most completions in the region are: Pasadena, Cerritos, and

⁴ Living wage data was pulled from California Family Needs Calculator on 10/26/2020. For more information, visit the California Family Needs Calculator website: <https://insightccd.org/2018-family-needs-calculator/>.

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Glendale. Over the past 12 months, there were three other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0924.00	Engineering Technology, General (requires Trigonometry)	Cerritos	6	23	26	18
		East LA	1	-	-	0
		Glendale	12	17	14	14
		Pasadena	122	173	176	157
		LA Subtotal	141	213	216	190
		Santa Ana	5	1	1	2
		OC Subtotal	5	1	1	2
Supply Total/Average			146	214	217	192

Non-Community College Supply—It is important to consider the supply from four-year institutions in the region that provide training programs for engineering technology. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Code: Engineering Technology, General (15.0000). Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, four-year colleges in the region conferred an average of 27 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2014-2017

CIP Code	Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Award Average
15.0000	Engineering Technology, General	California State Polytechnic University-Pomona	26	42	11	26
		California State University-Long Beach	1	-	-	0
Supply Total/Average			27	42	11	27

Appendix A: Occupational demand and wage data by county

Exhibit 4. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	2,206	2,208	2	0%	217	\$23.56	\$30.87	\$40.59
Industrial Engineering Technologists and Technicians (17-3026)	575	590	15	3%	59	\$23.84	\$31.57	\$43.12
Mechanical Engineering Technologists and Technicians (17-3027)	594	602	8	1%	60	\$25.94	\$34.14	\$41.24
Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other (17-3098)	1,089	1,124	35	3%	114	\$23.49	\$29.95	\$39.94
Total	4,464	4,523	59	1%	451			

Exhibit 5. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	3,788	3,686	(102)	(3%)	371	\$22.59	\$29.64	\$39.05
Industrial Engineering Technologists and Technicians (17-3026)	934	920	(14)	(1%)	93	\$22.45	\$29.82	\$40.84
Mechanical Engineering	1,040	1,016	(24)	(2%)	102	\$25.37	\$33.52	\$40.59

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Technologists and Technicians (17-3027)								
Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other (17-3098)	2,120	2,131	11	1%	214	\$22.93	\$29.53	\$39.59
Total	7,882	7,753	(129)	(2%)	779			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	5,994	5,893	(101)	(2%)	588
Industrial Engineering Technologists and Technicians (17-3026)	1,509	1,509	0	0%	152
Mechanical Engineering Technologists and Technicians (17-3027)	1,634	1,618	(16)	(1%)	162
Calibration Technologists and Technicians and Engineering Technologists and Technicians, Except Drafters, All Other (17-3098)	3,209	3,255	46	1%	328
Total	12,346	12,276	(70)	(1%)	1,230

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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