

Program Endorsement Brief: 0924.00/Engineering Technology

Sales Engineering, Technical Sales

Los Angeles/Orange County Center of Excellence, April 2021

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met <input type="checkbox"/>	Endorsed: Some Criteria Met <input checked="" 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 type="checkbox"/>	No <input checked="" type="checkbox"/>	
Emerging Occupation(s)			
	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	

The Los Angeles/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 two occupations: *sales engineers* (41-4011) and *sales representatives, wholesale and manufacturing, technical and scientific products* (41-9031). Middle-skill occupations typically require some postsecondary education or training, but less than a bachelor's degree.¹ Both of these occupations typically require a bachelor's degree and less than one-third of workers in the field have completed some college or an associate degree as their highest level of educational attainment, which classifies these two occupations as above middle-skill. 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, and whether this proposed program would lead to strong employment prospects for our students.

Based on the available data there appears to be a supply gap for these occupations in the region. Although the entry-level wages exceed the living wage in both Los Angeles and Orange counties, the majority of annual openings for the occupations in this report typically require a bachelor's degree. Job posting data further supports the desire of employers to hire candidates with a bachelor's degree. This barrier to employment suggests that a sales engineering training program might benefit from attracting candidates that have already obtained a bachelor's degree in a related field, but are looking to strengthen their skills in selling scientific and technical products. Students obtaining a certificate or associate degree may find it difficult to obtain employment until they further their education in the field. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

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.

Demand:

- **Supply Gap Criteria** – Over the next five years, there is projected to be **1,638 jobs available annually** in the region due to retirements and workers leaving the field, **which is more than the 798 awards conferred annually** by educational institutions in the region in related programs.
- **Living Wage Criteria** – Within Los Angeles County/Orange County, all of annual job openings for these two occupations have entry-level wages above the county's living wage (\$15.04/hour).²
- **Educational Criteria** – Within the LA/OC region, **all of the annual job openings** for occupations related to *sales engineers and sales representatives, wholesale and manufacturing, technical and scientific products* **typically require a bachelor's degree.**
 - However, the national-level educational attainment data indicates **between 16.2% and 32.1% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **15 community colleges** in the LA/OC region that issue awards in fields related to Sales Engineering, conferring an average of **621 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **177 awards conferred annually** in related training programs by non-community college institutions, all of which were generated by **10 individual four-year colleges throughout** the region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these two occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 4% through 2024. However, there will be more than 1,600 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.

² Living wage data was pulled from California Family Needs Calculator on 3/24/2021. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

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	11,597	11,096	(501)	(4%)	1,029
Orange	6,779	6,622	(157)	(2%)	609
Total	18,376	17,717	(659)	(4%)	1,638

Wages

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

Los Angeles County: Annual openings for these occupations have entry-level wages above the living wage for one adult (\$15.04 in Los Angeles County).⁴ Typical entry-level hourly wages are in a range between \$28.16 and \$31.48. *Sales engineers* tend to have slightly higher wages in comparison to *sales representatives, wholesale and manufacturing, technical and scientific products*. Experienced workers can expect to earn wages between \$52.40 and \$60.22, which are higher than the living wage estimate. Los Angeles County’s average wages are below the average statewide wage of \$46.79 for these occupations.

Orange County: Annual openings for these occupations have entry-level wages above the living wage for one adult (\$17.36 in Los Angeles County).⁵ Typical entry-level hourly wages are in a range between \$31.58 and \$33.66. Again, *sales engineers* tend to have slightly higher wages in comparison to *sales representatives, wholesale and manufacturing, technical and scientific products*. Experienced workers can expect to earn wages between \$58.47 and \$64.37, which are higher than the living wage estimate. Orange County’s average wages are below the average statewide wage of \$46.76 for these occupations.

Job Postings

There were 2,906 online job postings related to these two target occupations listed in the past 12 months. In order to further differentiate the qualities that make each occupation unique (minimum education requirements, common job titles, skills required, and employers actively seeking candidates), two separate job posting searches were performed, the results summarized below.

Sales Engineers-There were 396 online job postings related to *sales engineers* listed in the past 12 months. Of the 80% of job postings listing a minimum education requirement, 2.1% (6) requested an associate degree while 97.9% (279) requested a bachelor’s degree. The highest number of job postings were for sales engineer, technical sales engineer, and senior sales engineer. The top skills were sales, sales engineering, and technical sales. The top three

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.

⁴ Living wage data was pulled from California Family Needs Calculator on 3/24/2021. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

⁵ Ibid.

employers, by number of job postings, in the region were Charter Communications, Tanium, and Google Inc. The top industries that these job postings originated from were Internet Publishing and Broadcasting and Web Search Portals, Cable and Other Subscription Programming, and Storage Battery Manufacturing.

Sales representatives, wholesale and manufacturing, technical and scientific products- There were 2,510 online job postings related to *sales representatives, wholesale and manufacturing, technical and scientific products* listed in the past 12 months. Of the 67% of job postings listing a minimum education requirement, 15.8% (265) requested high school or vocational training, 5.5% (92) requested an associate degree, and 78.8% (1,323) requested a bachelor's degree. The highest number of job postings were for technical sales representative, medical sales representative (primarily for medical device sales), and pharmaceutical sales representative. The top skills were sales, technical sales, and customer service. The top three employers, by number of job postings, in the region were Metagrowth Ventures, Siemens, and Beyond Incorporated. The top industries were Software Publishers, Analytical Laboratory Instrument Manufacturing, and Other Scientific and Technical Consulting Services.

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.

Industries

The occupations listed in this report perform work in a variety of industries. According to industry staffing patterns, which indicate how occupations are divided among regional industries, *sales representatives, wholesale and manufacturing, technical and scientific products*, are primarily employed in the following industries (total employment is spread across industries ranging from those listed below to industrial machinery equipment sales, office equipment sales, plastics wholesalers, and many others):

- Drugs and Druggists' Sundries Merchant Wholesalers (10.4%),
- Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers (6.0%),
- Software Publishers (6.0%), and
- Computer and Computer Peripheral Equipment and Software Merchant Wholesalers (5.8%).

For *sales engineers*, the top industries were (again, total employment is spread across numerous industries, similar those listed above):

- Custom Computer Programming Services (7.0%),
- Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers (4.4%),
- Software Publishers (4.4%), and
- Computer Systems Design Services (4.3%).

Educational Attainment

The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for *sales representatives, wholesale and manufacturing, technical and scientific products* and *sales engineers*. In the LA/OC region, all annual job openings typically require a bachelor's degree.

However, the national-level educational attainment data indicates 16.2% -32.1% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Educational Supply

Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: International Business and Trade (0508.00); Sales and Salesmanship (0509.40); Engineering Technology, General (0924.00); and Other, Engineering and Related Industrial Technologies (0999.00). The colleges with the most completions in the region are Santa Ana, Pasadena, and Coastline.

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 Average
0508.00	International Business and Trade	Cerritos	10	13	26	16
		East LA	-	7	3	3
		Glendale	3	2	-	2
		LA Pierce	3	-	2	2
		Long Beach	6	14	4	8
		Mt San Antonio	38	24	28	30
		Pasadena	3	3	4	3
		Rio Hondo	3	1	1	2
		Santa Monica	2	3	-	2
		LA Subtotal	68	67	68	68
		Fullerton	2	-	1	1
		Orange Coast	12	14	-	9
		Saddleback	4	3	5	4
		Santa Ana	40	668	89	266
		OC Subtotal	58	685	95	279
Supply Subtotal			126	752	163	347
0509.40	Sales and Salesmanship	Cerritos	10	-	-	3
		Santa Monica	14	16	13	14
		LA Subtotal	24	16	13	18
		Orange Coast	-	11	3	5
		Santa Ana	-	1	-	-
		OC Subtotal	-	12	3	5
Supply Subtotal			24	28	16	23

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Average
0924.00	Engineering Technology, General	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 Subtotal			146	214	217	192
0999.00	Other, Engineering and Related Industrial Technologies	LA Trade	16	17	-	11
		LA Subtotal	16	17	-	11
		Coastline	39	49	57	48
		OC subtotal	39	49	57	48
Supply Subtotal			55	66	57	59
Grand Total			351	1060	453	621

Non-Community College Supply—Since these occupations typically require a bachelor’s degree, it is important to consider the supply from four-year institutions in the region that provide training programs for these occupations. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: 15.0000/Engineering Technology, General; 15.1599 Engineering-Related Fields, Other; 52.1101 International Business/Trade/Commerce. 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 177 awards annually in related training programs.

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

CIP Code	Program	College	2014-15 Awards	2015-16 Awards	2016-17 Awards	Latest 3-Yr Avg Awards
15.0000	Engineering Technology, General	California State Polytechnic University-Pomona	26	42	11	26
		California State	1	-	-	-

CIP Code	Program	College	2014-15 Awards	2015-16 Awards	2016-17 Awards	Latest 3-Yr Avg Awards
		University-Long Beach				
Supply Total/Average			27	42	11	26
15.1599	Engineering-Related Fields, Other	Art Center College of Design	36	32	39	36
Supply Total/Average			36	32	39	36
52.1101	International Business/Trade/Commerce	Azusa Pacific University	12	18	13	14
		California State University-Fullerton	37	58	49	48
		Mount Saint Mary's University	7	5	8	7
		Pepperdine University	29	28	28	28
		University of La Verne	12	8	6	9
		University of Southern California	-	-	26	9
		Vanguard University of Southern California	-	-	1	-
Supply Total/Average			97	117	131	115
Grand Total			160	191	181	177

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)	9,008	8,669	(339)	(4%)	792	\$28.16	\$37.15	\$52.40
Sales Engineers (41-9031)	2,589	2,426	(163)	(6%)	237	\$31.48	\$45.40	\$60.22
Total	11,597	11,096	(501)	(4%)	1,029			

Exhibit 5. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)	5,340	5,234	(106)	(2%)	475	\$31.58	\$41.56	\$58.47
Sales Engineers (41-9031)	1,439	1,388	(51)	(4%)	134	\$33.66	\$48.53	\$64.37
Total	6,779	6,622	(157)	(2%)	609			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry Level Educational Attainment
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)	14,348	13,903	(445)	(3%)	1,267	Bachelor's degree
Sales Engineers (41-9031)	4,028	3,814	(214)	(5%)	371	Bachelor's degree
Total	18,376	17,717	(659)	(4%)	1,638	

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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