

**Program Endorsement Brief: 0956.00/Manufacturing and Industrial Technology
Mechatronics, Robotics, and Automation**
Orange County Center of Excellence, August 2022

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 type="checkbox"/>	No <input checked="" type="checkbox"/> (<i>supply met</i>)	
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 three middle-skill occupations: *electro-mechanical and mechatronics technologists and technicians (17-3024)*, *industrial engineering technologists and technicians (17-3026)*, and *mechanical engineering technologists and technicians (17-3027)*. 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 does not appear to be a supply gap for these mechatronics occupations in the region. However, the labor market information suggests that supply has been met for these occupations because the average number of annual awards is within the COE’s 25% margin of annual job openings. Furthermore, these occupations typically require an associate degree and entry-level wages exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to some of 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 **356 jobs available annually** in the region due to retirements and workers leaving the field, **which is slightly less than the 397 awards conferred annually** by educational institutions in the region.
 - However, the labor market information suggests that the **supply has been met for these occupations within Los Angeles and Orange counties** since the

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.

average number of annual awards (supply) is within the COE's 25% margin of annual job openings (demand).

- **Living Wage Criteria** –Within Orange County, **all annual job openings** for these mechatronics occupations have **entry-level wages above the county's living wage** (\$20.63/hour).²
- **Educational Criteria** –Within Los Angeles and Orange counties, **all the annual job openings** for these mechatronics occupations **typically require an associate degree**.
 - Furthermore, the national-level educational attainment data indicates **51% of workers in the field have completed some college or an associate degree** as their highest level of education.

Supply:

- There are **15 community colleges** in Los Angeles and Orange counties that issue awards related to these mechatronics occupations, conferring an average of **318 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **79 awards conferred annually** in related training programs by non-community college institutions, all of which were generated by **3 individual four-year colleges throughout** the region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these mechatronics occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 3% through 2025. However, there will be more than 350 job openings per year through 2025 due to retirements and workers leaving the field.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

Geography	2020 Jobs	2025 Jobs	2020-2025 Change	2020-2025 % Change	Annual Openings
Los Angeles	2,418	2,329	(89)	(4%)	224
Orange	1,426	1,410	(16)	(1%)	132
Total	3,844	3,739	(105)	(3%)	356

Wages

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

² Living wage data was pulled from California Family Needs Calculator on 8/10/2022. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/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.

Orange County—All annual openings for these mechatronics occupations have entry-level wages above the living wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$24.22 and \$27.74. Experienced workers can expect to earn wages between \$39.39 and \$44.52, which are Orange County’s average wages are above the average statewide wage of \$32.96 for these occupations.

Los Angeles County—All annual openings for these mechatronics occupations have entry-level wages above the living wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$22.55 and \$26.83. Experienced workers can expect to earn wages between \$38.04 and \$42.93. Los Angeles County’s average wages are above the average statewide wage of \$32.96 for these occupations.

Job Postings

There were 8,983 online job postings related to these mechatronics occupations listed in the past 12 months. Of those, 82% (7,333) were for *industrial engineering technologists and technicians*. The highest number of job postings were for maintenance technicians, manufacturing technicians, production technicians, maintenance workers, and calibration technicians. The top skills were machinery, preventative maintenance, hand tools, good manufacturing practices, production equipment, and programmable logic controllers. The top three employers, by number of job postings, in the region were Aerotek, Northrop Grumman, and Disneyland Resort.

Educational Attainment

The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for all three of these mechatronics occupations. Furthermore, the national-level educational attainment data indicates 51% of workers in the field have completed some college or an associate degree as their highest level of education. Of the 56% of job postings listing a minimum education requirement in Los Angeles/Orange County, 65% (4,019) requested a high school diploma, 18% (1,130) requested an associate degree, and 13% (787) requested a bachelor’s degree.

Educational Supply

Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Engineering Technology, General (requires Trigonometry) (0924.00), Industrial Electronics (0934.20), Electron Microscopy (0934.70), Electro-Mechanical Technology (0935.00), and Manufacturing and Industrial Technology (0956.00). The colleges with the most completions in the region are: Pasadena, Santiago Canyon, and Cerritos. Over the past 12 months, there was one other related program recommendation request from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2017-2020

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
0924.00	Engineering Technology, General	Cerritos	23	26	15	21
		East LA	0	0	1	0
		Glendale	17	14	7	13

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
	(requires Trigonometry)	Mt San Antonio	0	0	2	1
		Pasadena	173	176	216	188
		LA Subtotal	213	216	241	223
		Santa Ana	1	1	3	2
		OC Subtotal	1	1	3	2
Supply Subtotal/Average			214	217	244	225
0934.20	Industrial Electronics	El Camino	1	0	0	0
		LA Subtotal	1	0	0	0
		-	-	-	-	-
		OC Subtotal	-	-	-	-
Supply Subtotal/Average			1	0	0	0
0934.70	Electron Microscopy	East LA	5	3	0	3
		LA Subtotal	5	3	0	3
		-	-	-	-	-
		OC Subtotal	-	-	-	-
Supply Subtotal/Average			5	3	0	3
0935.00	Electro-Mechanical Technology	-	-	-	-	-
		LA Subtotal	-	-	-	-
		Orange Coast	3	2	0	2
		Santa Ana	0	1	8	3
		OC Subtotal	3	3	8	5
Supply Subtotal/Average			3	3	8	5
0956.00	Manufacturing and Industrial Technology	Cerritos	6	2	0	3
		Compton	2	0	0	1
		El Camino	3	2	0	2
		Glendale	0	0	2	1
		LA Trade	0	5	9	5
		LA Valley	2	3	9	5
		Mt San Antonio	9	13	14	12
		LA Subtotal	22	25	34	29
		Fullerton	11	9	38	19
		Irvine	1	3	0	1
		Saddleback	9	11	7	9
		Santa Ana	1	0	3	1

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		Santiago Canyon	27	41	10	26
		OC Subtotal	49	64	58	56
Supply Subtotal/Average			71	89	92	85
Supply Total/Average			294	312	344	318

Non-Community College Supply—For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for these mechatronics occupations. Exhibit 3 shows the annual and three-year average number of awards conferred by this/these institutions in the related Classification of Instructional Programs (CIP) Codes: Industrial Technology/Technician (15.0612), Manufacturing Engineering Technology/Technician (15.0613), and Mechanical Engineering/Mechanical Technology/Technician (15.0805). Due to different data collection periods, the most recent three-year period of available data is from 2016 to 2019. Between 2016 and 2019, four-year colleges in the region conferred an average of 79 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2016-2019

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
15.0612	Industrial Technology/Technician	California State University-Los Angeles	50	32	40	41
Supply Subtotal/Average			50	32	40	41
15.0613	Manufacturing Engineering Technology/Technician	California State University-Long Beach	2	0	0	1
Supply Subtotal/Average			2	0	0	1
15.0805	Mechanical Engineering/Mechanical Technology/Technician	California State Polytechnic University-Pomona	41	35	35	37
Supply Subtotal/Average			41	35	35	37
Supply Total/Average			93	67	75	79

Appendix A: Occupational demand and wage data by county

Exhibit 4. Orange County

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electro-Mechanical and Mechatronics Technologists and Technicians (17-3024)	293	280	(13)	(4%)	27	\$24.40	\$31.27	\$39.39
Industrial Engineering Technologists and Technicians (17-3026)	611	604	(7)	(1%)	56	\$24.22	\$32.83	\$44.52
Mechanical Engineering Technologists and Technicians (17-3027)	522	526	4	1%	50	\$27.74	\$36.38	\$44.08
Total	1,426	1,410	(16)	(1%)	132			

Exhibit 5. Los Angeles County

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electro-Mechanical and Mechatronics Technologists and Technicians (17-3024)	507	464	(43)	(8%)	45	\$23.49	\$30.16	\$38.04
Industrial Engineering Technologists and Technicians (17-3026)	992	971	(21)	(2%)	93	\$22.55	\$30.66	\$41.72
Mechanical Engineering Technologists and Technicians (17-3027)	919	894	(25)	(3%)	86	\$26.83	\$35.34	\$42.93
Total	2,418	2,329	(89)	(4%)	224			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings
Electro-Mechanical and Mechatronics Technologists and Technicians (17-3024)	800	744	(55)	(7%)	72
Industrial Engineering Technologists and Technicians (17-3026)	1,603	1,575	(28)	(2%)	149
Mechanical Engineering Technologists and Technicians (17-3027)	1,441	1,420	(21)	(1%)	135
Total	3,844	3,739	(105)	(3%)	356

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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