

# Labor Market Analysis: 0935.00 – Electro-Mechanical Technology Robotics Pre-Internship Preparation – Certificate requiring 6 to <18 semester units

Los Angeles Center of Excellence, April 2024

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

## SUMMARY

This report analyzes whether local labor market demand is being met by community college programs aligned with the identified middle-skill occupation<sup>1</sup> or whether a shortage of workers exists. Labor market demand is measured by annual job openings while education supply is measured by the number of awards (degrees and certificates) conferred on average each year.

Based on the available data, there appears to be a supply gap for the one identified middle-skill occupation in the region. Furthermore, entry-level wages exceed the self-sufficiency standard wage in both Los Angeles and Orange counties, and the Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education.

**Recommendation:** Due to all three program endorsement criteria being met, the Los Angeles Center of Excellence for Labor Market Research (LACOE) endorses this proposed program.

## Key Findings

### Supply Gap

- 47 annual job openings are projected in the region through 2027. This number is greater than the three-year average of 4 awards conferred by educational institutions in the region.

<sup>1</sup> Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree. 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**

- \$23.37 is the typical entry-level hourly wage for electro-mechanical and mechatronics technologists and technicians, which is higher than Los Angeles County's self-sufficiency standard hourly (\$18.10/hour).<sup>2</sup>

### **Educational Attainment**

- An associate degree is the typical entry-level education for electro-mechanical and mechatronics technologists and technicians according to the Bureau of Labor Statistics (BLS).
- 51% of workers in the field have completed some college or an associate degree, according to national educational attainment data.

### **Community college supply**

- One community college issued awards related to electro-mechanical technology in the greater LA/OC region.
- 4 awards (degrees and certificates) were conferred on average each year between 2019 and 2022.
- 7 community colleges in the Los Angeles/Orange County region currently offer robotics programs.

### **Other postsecondary supply**

- No educational institutions in the Los Angeles/Orange County region offer programs that specifically train for electro-mechanical and mechatronics technologists and technicians.
- While there are various engineering technician programs at Los Angeles County postsecondary institutes that may teach robotics skills, there are no programs specifically coded within the electro-mechanical technology discipline, such as Electromechanical Technology/Electromechanical Engineering Technology (CIP 15.0403) or Robotics Technology/Technician (15.0405).

## **TARGET OCCUPATIONS**

LA COE prepared this report to provide regional labor market and postsecondary supply data related to one middle-skill occupation and one emerging occupation. [For full occupation descriptions, please see Appendix.](#)

- **Electro-Mechanical and Mechatronics Technologists and Technicians (17-3024)**<sup>3</sup>
  - **Robotics Technicians (17-3024.01)**<sup>4</sup>

## **OCCUPATIONAL DEMAND**

Exhibit 1 shows the five-year occupational demand projections for electro-mechanical and mechatronics technologists and technicians. In the greater Los Angeles/Orange County region, the number of jobs related to this occupation is projected to decrease by 2% through 2027. However, there will be approximately 47 job openings per year through 2027 due to retirements

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<sup>2</sup> Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

<sup>3</sup> [Electro-mechanical and Mechatronics Technologists and Technicians \(bls.gov\)](#)

<sup>4</sup> [Robotics Technicians \(onetonline.org\)](#)

and workers leaving the field. The majority of jobs in 2022 for electro-mechanical and mechatronics technologists and technicians (65%) were located in Los Angeles County.

**Exhibit 1: Current employment and occupational demand, Los Angeles and Orange counties<sup>5</sup>**

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	337	326	(11)	(3%)	30
Orange	184	186	2	1%	17
<b>Total</b>	<b>521</b>	<b>511</b>	<b>(10)</b>	<b>(2%)</b>	<b>47</b>

**Detailed Occupation Data**

Exhibit 2 displays the current employment and projected occupational demand for the target occupation in Los Angeles County. The percentage of workers aged 55+ workers is included in order visualize upcoming replacement demand for these occupations.

**Exhibit 2: Current employment, projected occupational demand, percentage of workers aged 55+, Los Angeles County<sup>6</sup>**

Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	% Aged 55 and older*
Electro-Mechanical and Mechatronics Technologists and Technicians	337	326	(11)	(3%)	30	31%

\*The average percentage of workers aged 55 and older across all occupations in the greater LA/OC region is 27%. This occupation has a larger share of older workers, which typically indicates greater replacements needs to offset the amount of impending retirements.

**WAGES**

The labor market endorsement in this report considers the entry-level hourly wages for electro-mechanical and mechatronics technologists and technicians in Los Angeles County as they relate to the county’s self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater Los Angeles/Orange County region.

**Los Angeles County**

The typical entry-level hourly wages for electro-mechanical and mechatronics technologists and technicians are \$23.37, which is above the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Experienced workers can expect to earn wages of \$38.50 (Exhibit 3).

<sup>5</sup> Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

<sup>6</sup> Ibid.

### Exhibit 3: Earnings for occupations in Los Angeles County

Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)	Median Annual Earnings*
Electro-Mechanical and Mechatronics Technologists and Technicians	\$23.37	\$30.24	\$38.50	\$62,900

\*Rounded to the nearest \$100

### Orange County

The typical entry-level hourly wages for electro-mechanical and mechatronics technologists and technicians are \$23.98, which is above the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Experienced workers can expect to earn wages of \$39.33 (Exhibit 4).

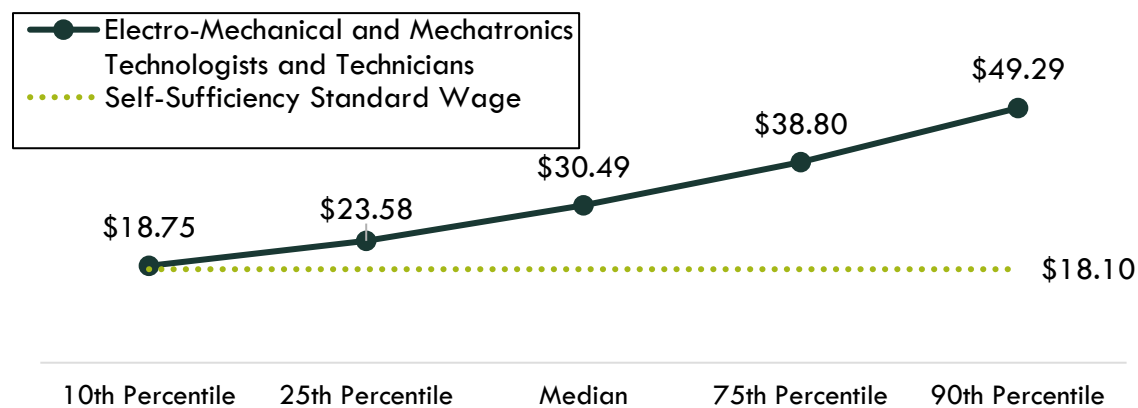
### Exhibit 4: Earnings for occupations in Orange County

Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)	Median Annual Earnings*
Electro-Mechanical and Mechatronics Technologists and Technicians	\$23.98	\$30.95	\$39.33	\$64,400

\*Rounded to the nearest \$100

On average, the entry-level hourly earnings for the occupation in this report are \$23.58; this is above the living wage for one single adult in Los Angeles County (\$18.10). Exhibit 5 shows the average hourly wage for the occupations in this report, for entry-level to experienced workers.

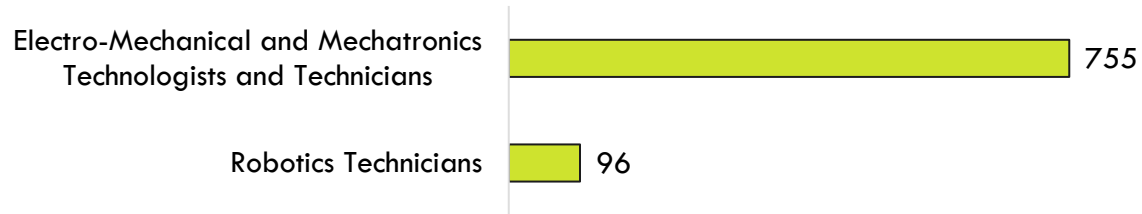
### Exhibit 5: Average hourly earnings for electro-mechanical and mechatronics technologists and technicians, Los Angeles and Orange counties



## JOB POSTINGS

There were 851 online job postings related to the occupations in this report listed in the past 12 months in Los Angeles and Orange counties. Exhibit 6 displays the number of job postings by occupation. The majority of job postings (89%) were for electro-mechanical and mechatronics technologists and technicians, followed by robotics technicians (11%).

## Exhibit 6: Job postings by occupation (last 12 months), Los Angeles and Orange counties



Job postings were analyzed for the most common job titles, skills, and employers associated with the target occupations in this report (Exhibit 7).

## Exhibit 7: Most commonly requested job titles, skills and employers in job postings, Los Angeles and Orange counties

Top Job Titles	Top Skills	Top Employers
<ul style="list-style-type: none"> <li>• Calibration technicians</li> <li>• Electronics technicians</li> <li>• Instrumentation technicians</li> <li>• Electromechanical assemblers</li> <li>• Electrical and instrumentation technicians</li> </ul>	<ul style="list-style-type: none"> <li>• Electronics</li> <li>• Test equipment</li> <li>• Calibration</li> <li>• Instrumentation</li> <li>• Soldering</li> </ul>	<ul style="list-style-type: none"> <li>• Disney</li> <li>• Acara Solutions*</li> <li>• Gulfstream Aerospace</li> <li>• Aerotek*</li> <li>• General Atomics</li> </ul>

\*Staffing company

In the greater Los Angeles/Orange County region, 58% of the electro-mechanical and mechatronics technologist and technician job postings listed a minimum educational requirement. The number and percentage of job postings by educational level appear in exhibit 8.

## Exhibit 8: Education levels requested in job postings for electro-mechanical and mechatronics technologists and technicians, Los Angeles and Orange counties

Education Level	Job Postings	% of Job Postings
High school diploma or vocational training	311	63%
Associate degree	136	28%
Bachelor's degree	45	9%

## EDUCATIONAL ATTAINMENT

The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for electro-mechanical and mechatronics technologists and technicians (Exhibit 9). Furthermore, the national-level data indicates 51% of workers in the field have completed some college or an associate degree as their highest level of educational attainment. The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the occupations in this report:

**Exhibit 9: Entry-level education preferred by employers nationally, Bureau of Labor Statistics**

Occupation	Education Level
Electro-Mechanical and Mechatronics Technologists and Technicians	Associate degree

**EDUCATIONAL SUPPLY**

**Community College Supply**

Exhibit 10 shows the annual and three-year average number of awards conferred by community colleges in the related TOP code: Electro-Mechanical Technology (0935.00). The only college with completions in the region is Santa Ana.

**Exhibit 10: Regional community college awards (certificates and degrees), 2019-2022**

TOP Code	Program	College	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Average
0935.00	Electro-Mechanical Technology	Santa Ana	8	-	4	4
		<b>OC Subtotal</b>	<b>8</b>	<b>-</b>	<b>4</b>	<b>4</b>
<b>Supply Total/Average</b>			<b>8</b>	<b>-</b>	<b>4</b>	<b>4</b>

Exhibit 11 shows the current robotics programs offered at community colleges throughout the state. Seven community colleges in the Los Angeles/Orange County region currently offer robotics programs, including one associate degree program, three certificate programs, and four noncredit programs. Since these programs are widely distributed among TOP codes and many of the programs are relatively new, awards data for all robotics programs is not available.

**Exhibit 11: Current community college robotics programs in California**

TOP Code	Program Title	College	Award Type	Approval Date
0707.00 – Computer Software Development	Robotics	L.A. Mission	Noncredit	January 2021
0934.00 – Electronics and Electric Technology	Robotics and PLCs	L.A. Valley	Noncredit	June 2020

TOP Code	Program Title	College	Award Type	Approval Date
0934.20 – Industrial Electronics	Robotics	American River	Certificate of Achievement	January 2008
	Robotics and Mechatronics Controls	Laney	Certificate of Achievement	February 2019
	Robotics Exploration	Long Beach	Noncredit	July 2023
0935.00 – Electro-Mechanical Technology	Robotics Technician	Orange Coast	Certificate of Achievement	October 2021
	Fundamentals of Robotics	L.A. Southwest	Noncredit	May 2021
0956.00 – Manufacturing and Industrial Technology	Mechatronics, Robotics and Automation	Cypress	A.S. Degree	August 2023
	Robotics Technician	Cypress	Certificate of Achievement	September 2023
	Industrial Automation and Robotics	Diablo Valley	Certificate of Achievement	March 2021
	Essentials of Robotics and Programming	West L.A.	Certificate of Achievement	February 2024

## Other Postsecondary Supply

For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for electro-mechanical and mechatronics technologists and technicians. While there are various engineering technician programs at Los Angeles County postsecondary institutes that may teach robotics skills, there are no programs specifically coded within the electro-mechanical technology discipline, such as Electromechanical Technology/Electromechanical Engineering Technology (CIP 15.0403) or Robotics Technology/Technician (15.0405).

According to RoboticsCareer.org, the following postsecondary robotics training programs are offered in the Los Angeles/Orange County region:

**Exhibit 12: Other postsecondary robotics programs in Los Angeles and Orange counties<sup>7</sup>**

<b>Program Title</b>	<b>College</b>	<b>Award Type</b>	<b>Program Length</b>
Computer Science – Intelligent Robotics*	University of Southern California	Master’s degree	1 Year
Electrical Engineering	California Institute of Technology	Bachelor’s degree	4 years
Electronics Engineering Technology	California State University – Long Beach	Bachelor’s degree	4 years
Mechanical Engineering	California State University – Long Beach	Bachelor’s degree	4 years

\*Program discontinued effective Fall 2024

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<sup>7</sup> [RoboticsCareer.org](https://www.RoboticsCareer.org)



## APPENDIX: OCCUPATION DESCRIPTIONS

LA COE prepared this report to provide regional labor market supply and demand data related to these target occupations:

- **Electro-Mechanical and Mechatronics Technologists and Technicians (17-3024)** Operate, test, maintain, or adjust unmanned, automated, servomechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment to observe or record visual information at sites such as oil rigs, crop fields, buildings, or for similar infrastructure, deep ocean exploration, or hazardous waste removal. May assist engineers in testing and designing robotics equipment.
  - **Robotics Technicians (17-3024.01)** Build, install, test, or maintain robotic equipment or related automated production systems.

### Contact information:

Luke Meyer, Director

Los Angeles Center of Excellence

[lmeyer7@mtsac.edu](mailto:lmeyer7@mtsac.edu)

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### DATA SOURCES

- O\*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)
- Advanced Robotics for Manufacturing Institute

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