










Electro-Mechanical and Mechatronics Technologists and Technicians

Labor Market Analysis: San Diego County

October 2022

Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED LEVEL OF EDUCATION
 Proceed with New Program	 	 	<input type="checkbox"/> Bachelor's Degree+ <input checked="" type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less than a HS Diploma <input type="checkbox"/> Apprenticeship
SUPPORT FOR PROGRAM MODIFICATION?	NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING	NUMBER OF ANNUAL JOB OPENINGS	
 	<p>LOW</p> 	<p>LOW</p> 	

The San Diego-Imperial Center of Excellence for Labor Market Research (COE) developed this brief to assist the region's community colleges with strategic planning and program development. According to available labor market information, *Electro-Mechanical and Mechatronics Technologists and Technicians* in San Diego County have a labor market demand of 14 annual job openings (while average demand for a single occupation in San Diego County is 242 annual job openings), and no educational institutions in San Diego County supply awards for this occupation, suggesting that there is a supply gap in the labor market. Entry-level wages are above the living wage for this occupation. This brief recommends to proceed with developing a new program and supports a program modification because 1) there is a supply gap in the region; 2) entry-level earnings for this occupation are above the living wage; and 3) no educational institutions currently train for this occupation.

Introduction

This report provides labor market information in San Diego County for the following occupational code in the Standard Occupational Classification (SOC)¹ system:

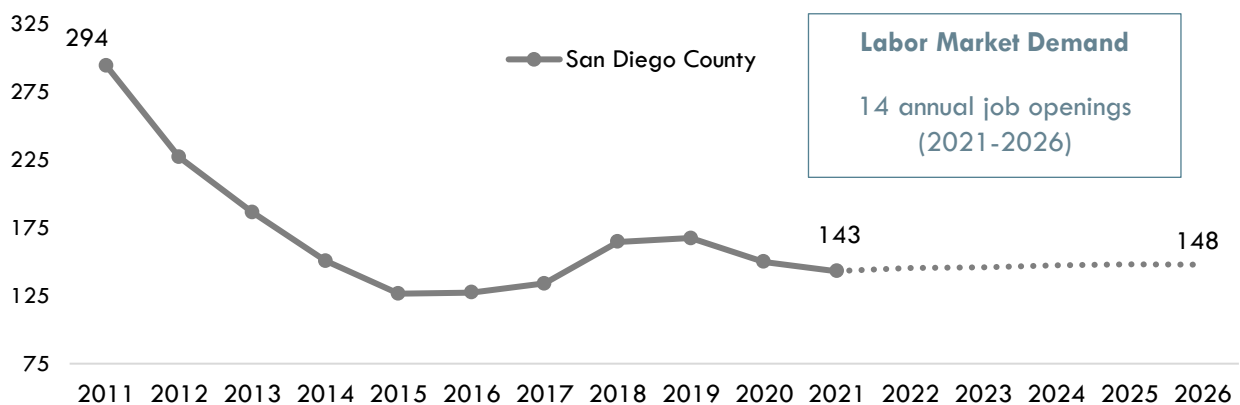
Electro-Mechanical and Mechatronics Technologists and Technicians (SOC 17-3024): Operate, test, maintain, or adjust unmanned, automated, servomechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment to observe or record visual information at sites such 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. Sample reported job titles include:

- Product Test Specialist
- Process Control Tech
- Mechanical Technician
- Maintenance Technician
- Instrumentation and Process Controls Technician
- Automation Technician
- Programmable Logic Controllers Technician
- Process Control Technician
- Instrumentation and Controls Technician
- Engineering Technician

Projected Occupational Demand

Between 2021 and 2026, *Electro-Mechanical and Mechatronics Technologists and Technicians* are projected to increase by **five** net jobs or **three** percent (Exhibit 1). Employers in San Diego County will need to hire **14** workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

Exhibit 1: Number of Jobs for *Electro-Mechanical and Mechatronics Technologists and Technicians* (2011-2026)²



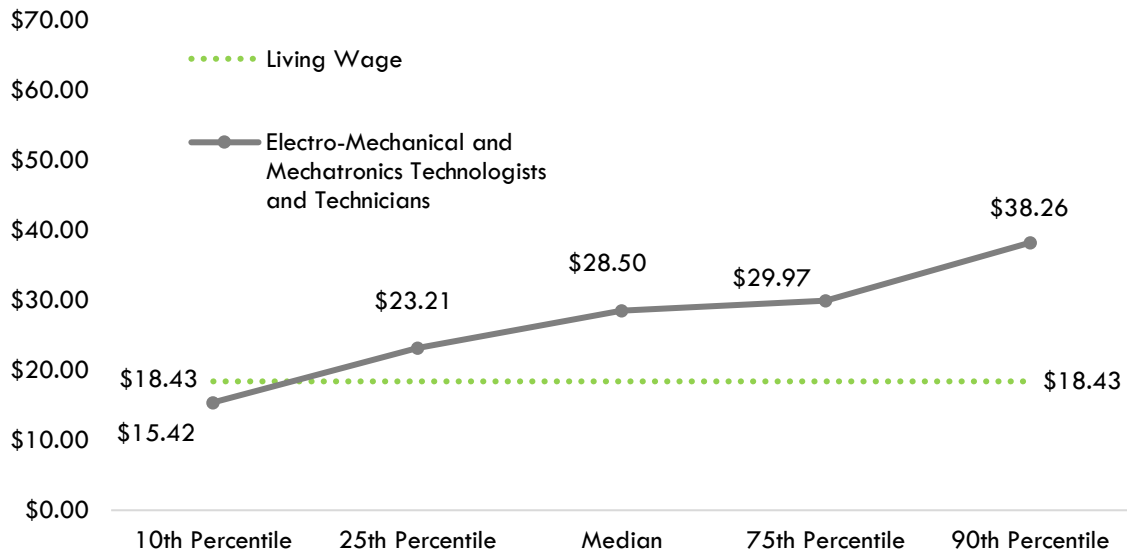
¹ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc/).

² EMSI 2022.03; QCEW, Non-QCEW, Self-Employed.

Earnings

Electro-Mechanical and Mechatronics Technologists and Technicians receive entry-level hourly earnings of **\$23.21**; this is more than the living wage for a single adult in San Diego County, which is **\$18.43** per hour (Exhibit 2).³

Exhibit 2: Hourly Earnings⁴ for Electro-Mechanical and Mechatronics Technologists and Technicians in San Diego County⁵



³ "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightccd.org/family-needs-calculator.

⁴ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

⁵ EMSI 2022.03; QCEW, Non-QCEW, Self-Employed.

Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.⁶ There are three TOP codes and three CIP codes related to *Electro-Mechanical and Mechatronics Technologists and Technicians* (Exhibit 3).

Exhibit 3: Related TOP and CIP Codes for *Electro-Mechanical and Mechatronics Technologists and Technicians*

TOP or CIP Code	TOP or CIP Program Title
TOP 0935.00	Electro-Mechanical Technology
TOP 0943.00	Instrumentation Technology
TOP 0948.40	Alternative Fuels and Advanced Transportation Technology
CIP 15.0403	Electromechanical Technology/Electromechanical Engineering Technology
CIP 15.0404	Instrumentation Technology/Technician
CIP 47.0614	Alternative Fuel Vehicle Technology/Technician

⁶ TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).

According to TOP and CIP data, no community college or other educational institution supplies the region with awards for this occupation (Exhibit 4).

**Exhibit 4: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions
(Program Year 2017-18 through Program Year 2020-21 Average)**

TOP6 or CIP	TOP6 or CIP Title	3-Yr Annual Average CC Awards (PY18-19 to PY20-21)	Other Educational Institutions 3-Yr Annual Average Awards (PY17-18 to PY19-20)	3-Yr Total Average Supply (PY17-18 to PY20-21)
0935.00	Electro-Mechanical Technology	0	0	0
0943.00	Instrumentation Technology	0	0	0
0948.40	Alternative Fuels and Advanced Transportation Technology	0	0	0
15.0403	Electromechanical Technology/Electromechanical Engineering Technology	0	0	0
15.0404	Instrumentation Technology/Technician	0	0	0
47.0614	Alternative Fuel Vehicle Technology/Technician	0	0	0
			Total	0

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply⁷ suggests that there is a supply gap for this occupation in San Diego County, with 14 annual openings and zero awards. Comparatively, there are 143 annual openings in California and 129 awards, suggesting that there is also a supply gap across the state⁸ (Exhibit 5).

Exhibit 5: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

	Demand (Annual Openings)	Supply (Total Annual Average Supply)	Supply Gap or Oversupply
San Diego	14	0	14
California	143	129	14

Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

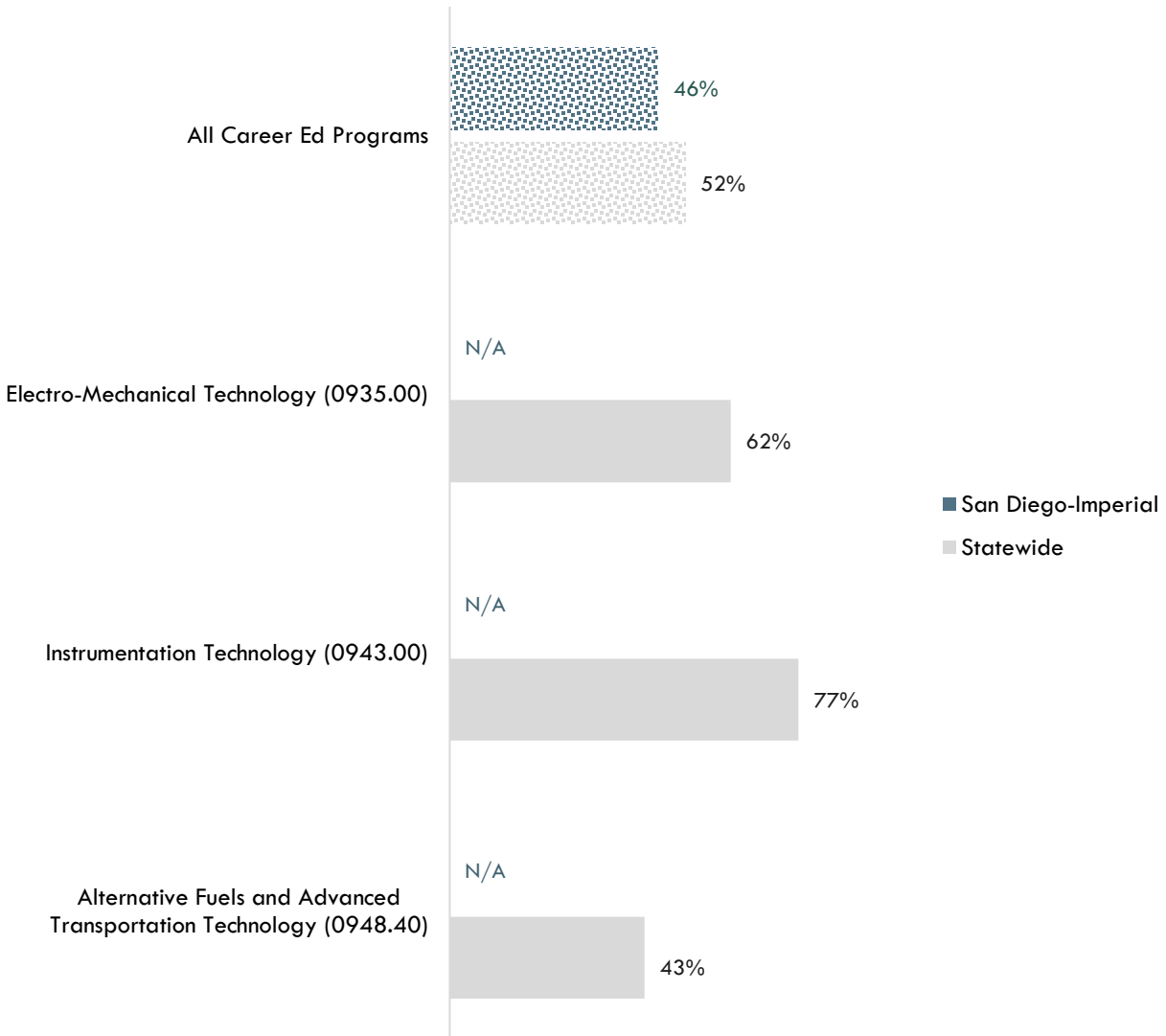
⁷ Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

⁸ "Supply and Demand," Centers of Excellence Student Outcomes, <https://coecc.net/our-resources>.

Student Outcomes and Regional Comparisons

According to the California Community Colleges LaunchBoard, 43 to 77 percent of students statewide earned a living wage after completing a program related to *Electro-Mechanical and Mechatronics Technologists and Technicians*, compared to 52 percent of students in Career Education programs in general across the state (Exhibit 6a).⁹

Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program, PY2019-20¹⁰



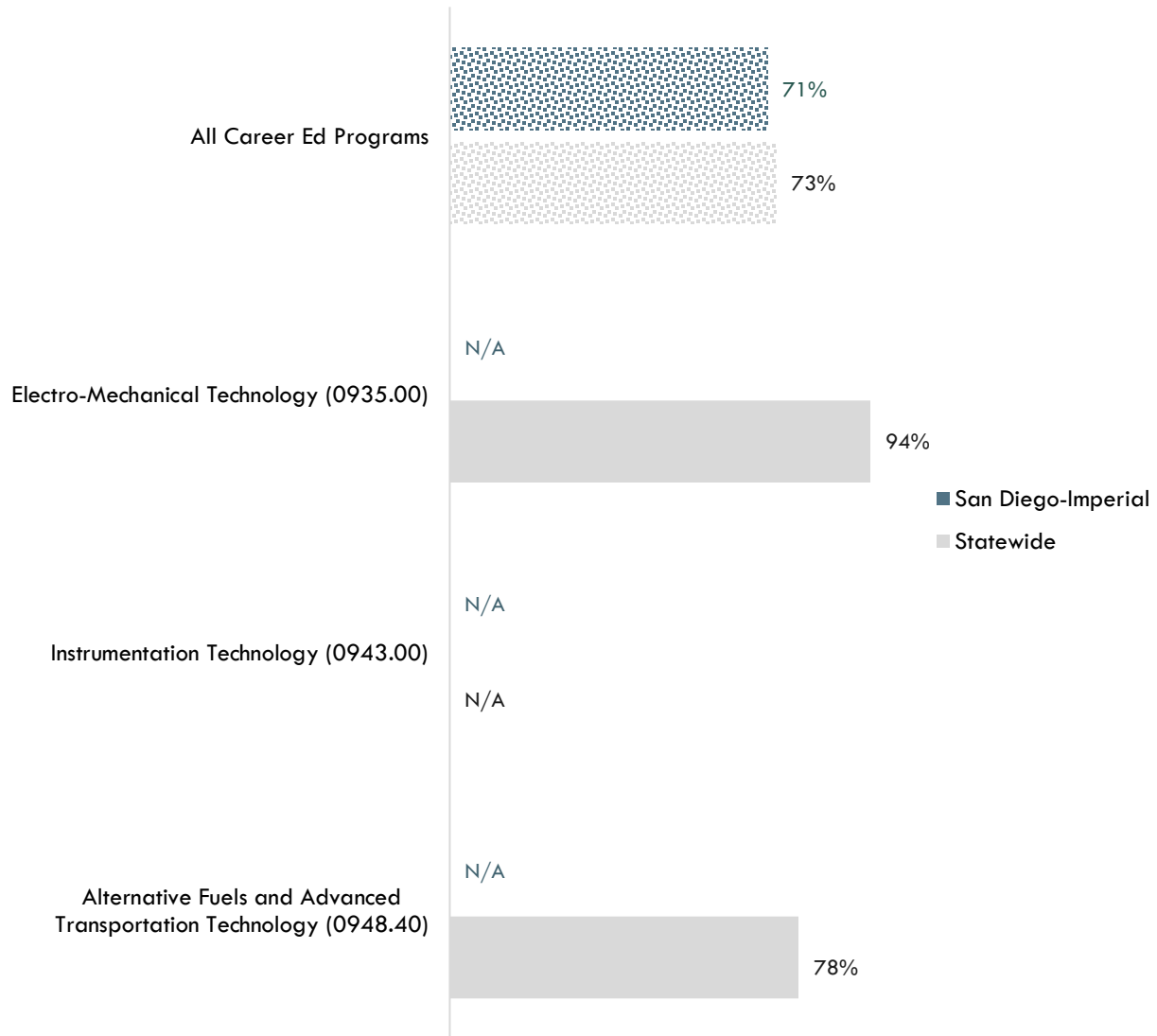
"N/A" indicates insufficient data

⁹ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹⁰ Most recent year with available data is Program Year 2019-20. Among completers and skills builders who exited, the percentage of students who attained a living wage.

According to the California Community Colleges LaunchBoard, 78 to 94 percent of students statewide obtained a job closely related to their field of study after completing a program related to *Electro-Mechanical and Mechatronics Technologists and Technicians*, compared 73 percent of students in Career Education programs in general across the state (Exhibit 6b).¹¹

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2018-19¹²



"N/A" indicates insufficient data

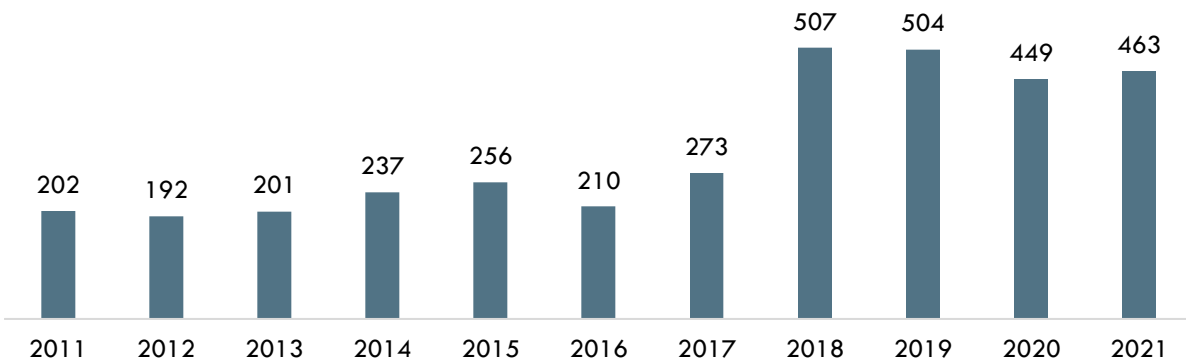
¹¹ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹² Most recent year with available data is Program Year 2018-19. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2011 and 2021, there was an average of 318 online job postings per year for *Electro-Mechanical and Mechatronics Technologists and Technicians* in San Diego County (Exhibit 7). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1). While this brief includes online jobs postings data to help with curriculum development, the community colleges should note that this type of data is impacted by several variables: employers may post a position multiple times to increase the pool of applicants; a job posting can remain posted after a business decides not to fill a position; or an employer may use one posting to fill multiple positions, for example.

Exhibit 7: Number of Online Job Postings for *Electro-Mechanical and Mechatronics Technologists and Technicians* in San Diego County (2011-2021)¹³



¹³ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2011-2021.

Top Employers

Between January 1, 2019 and December 31, 2021, the top five employers in San Diego County for *Electro-Mechanical and Mechatronics Technologists and Technicians* were General Dynamics, General Atomics, University of California San Diego, Advanced Test Equipment Rentals, and SAIC based on online job postings (Exhibit 8).

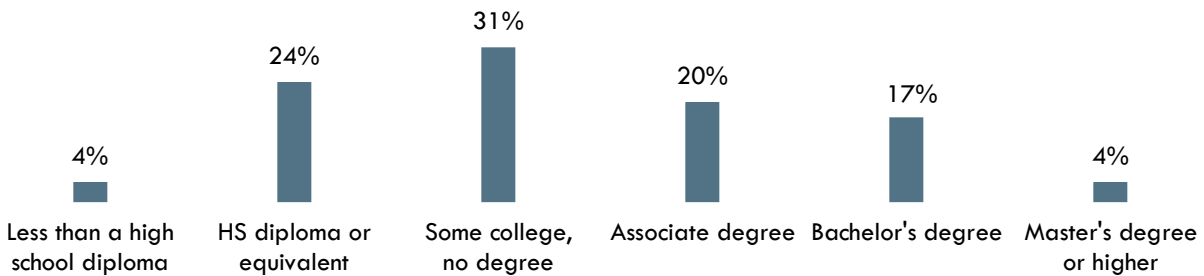
Exhibit 8: Top Employers for *Electro-Mechanical and Mechatronics Technologists and Technicians* in San Diego County¹⁴

Top Employers	
<ul style="list-style-type: none"> • General Dynamics • General Atomics • University of California San Diego • Advanced Test Equipment Rentals • SAIC 	<ul style="list-style-type: none"> • Viasat • Ameer Bay, LLC • Centurum, Inc. • City of San Diego • Northrop Grumman

Education, Skills, and Certifications

Exhibit 9 indicates that the typical educational attainment for the occupation found currently in the national labor force is *some college, no degree*. The typical entry-level education is an *associate degree*.¹⁵

Exhibit 9: National Educational Attainment of *Electro-Mechanical and Mechatronics Technologists and Technicians*¹⁶



¹⁴ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019-2021.

¹⁵ EMSI 2022.03; QCEW, Non-QCEW, Self-Employed.

¹⁶ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified September 8, 2021. bls.gov/emp/tables/educational-attainment.htm.

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2019 and December 31, 2021.

**Exhibit 10: Top Skills for *Electro-Mechanical and Mechatronics Technologists and Technicians*
in San Diego County¹⁷**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Repair • Calibration • Test Equipment • Soldering • Schematic Diagrams • Hand Tools • Wiring • Oscilloscopes • Mechanical Assembly • Electromechanical Assemblies • Quality Assurance and Control • Power Tools • Electronics Industry Knowledge • Scheduling • Robotics 	<ul style="list-style-type: none"> • Troubleshooting • Communication Skills • Physical Abilities • Computer Literacy • Detail-Oriented • Preventive Maintenance • Writing • Teamwork / Collaboration • Problem Solving • Research • Organizational Skills • Verbal / Oral Communication • English • Planning • Multi-Tasking 	<ul style="list-style-type: none"> • Microsoft Excel • Microsoft Word • Microsoft PowerPoint • SAP • Microsoft Outlook • Enterprise Resource Planning • SCADA • C4ISR • Linux • Function generator • Microsoft Access • Oracle • UNIX • LabVIEW • Microsoft Project

¹⁷ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019-2021.

Exhibit 11 lists the top certifications that appeared in online job postings between January 1, 2019 and December 31, 2021.

Exhibit 11: Top Certifications for *Electro-Mechanical and Mechatronics Technologists and Technicians* in San Diego County¹⁸

Top Certifications in Online Job Postings

1. Security Clearance
 2. IPC Certification
 3. Competent Person Certification
 4. Certified Calibration Technician (CCT)
 5. Basic Life Saving (BLS)
 6. First Aid CPR AED
 7. Electrician Certification
 8. CompTIA Security+
 9. Basic Cardiac Life Support Certification
 10. Certified Control Systems Technician
 11. Certified Control Systems Technician (CCST)
 12. American Registry For Diagnostic Medical Sonography (ARDMS)
 13. American Society For Quality (ASQ) Certification
 14. Occupational Safety and Health Administration Certification
 15. Certified Cardiographic Technician (CCT)
-

¹⁸ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019-2021.

Prepared by:

Tina Ngo Bartel, Director (tngobartel@miracosta.edu)

John Edwards, Research Analyst (jedwards@miracosta.edu)

San Diego-Imperial Center of Excellence for Labor Market Research



Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

This workforce demand report uses state and federal job projection data that was developed before the economic impact of COVID-19. The COE is monitoring the situation and will provide more information as it becomes available. Please consult with local employers to understand their current employment needs.