










# Engineering Technology Occupations

Labor Market Analysis: San Diego County

November 2024

## Summary

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

The San Diego & Imperial Center of Excellence (COE) developed this brief to assist the region’s community colleges with strategic planning and program development. *Engineering Technology Occupations* include “Electrical and Electronic Engineering Technologists and Technicians,” “Electro-Mechanical and Mechatronics Technologists and Technicians,” “Industrial Engineering Technologists and Technicians,” “Industrial Machinery Mechanics,” and “Mechanical Engineering Technologists and Technicians.” According to available data, *Engineering Technology Occupations* in San Diego County have a labor market demand of 631 annual job openings (while average demand for a single occupation in San Diego County is 289 annual job openings), and eight institutions supply 89 awards for these occupations, suggesting that there is a supply gap in the labor market. Employers historically reported to the California Employment Development Department (EDD) and U.S. Bureau of Labor Statistics (BLS) that on average *Engineering Technology Occupations* earned entry-level earnings of \$27.59 per hour, which is above the living wage in San Diego County. Comparatively, recent online job postings (2021-2023) show median earnings between \$21 to \$28 per hour. This brief recommends developing a new program and supports a program modification because 1) there is a supply gap in the region; 2) there is a high number of annual job openings; and 3) entry-level wages are above the living wage.

## Introduction

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

- **Electrical and Electronic Engineering Technologists and Technicians (SOC 17-3023):** Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, adjust, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.
- **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.
- **Industrial Engineering Technologists and Technicians (SOC 17-3026):** Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May perform time and motion studies on worker operations in a variety of industries for purposes such as establishing standard production rates or improving efficiency.
- **Industrial Machinery Mechanics (SOC 49-9041):** Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems. May also install, dismantle, or move machinery and heavy equipment according to plans.
- **Mechanical Engineering Technologists and Technicians (SOC 17-3027):** Apply theory and principles of mechanical engineering to modify, develop, test, or adjust machinery and equipment under direction of engineering staff or physical scientists.

For the purpose of this report, these occupations are referred to as *Engineering Technology Occupations*.

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<sup>1</sup> 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/).

## Projected Occupational Demand

Between 2023 and 2028, employers in San Diego County will need to hire 631 workers annually to fill new jobs and backfill jobs in *Engineering Technology Occupations* due to attrition caused by turnover and retirement, for example (Exhibit 1). “Electrical and Electronic Engineering Technologists and Technicians” are projected to have the most labor market demand between 2023 and 2028, with 289 annual job openings.

**Exhibit 1: Number of Jobs for Engineering Technology Occupations (2023-2028)<sup>2</sup>**

Occupational Title	2023 Jobs	2028 Jobs	2023 – 2028 Net Jobs Change	2023 - 2028 % Net Jobs Change	Annual Job Openings (Demand)
Electrical and Electronic Engineering Technologists and Technicians	2,800	2,879	79	3%	289
Industrial Machinery Mechanics	1,994	2,227	233	12%	210
Industrial Engineering Technologists and Technicians	624	672	48	8%	68
Mechanical Engineering Technologists and Technicians	353	391	38	11%	41
Electro-Mechanical and Mechatronics Technologists and Technicians	222	234	12	5%	23
<b>Total</b>	<b>5,993</b>	<b>6,403</b>	<b>410</b>	<b>7%</b>	<b>631</b>

<sup>2</sup> Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

## Earnings

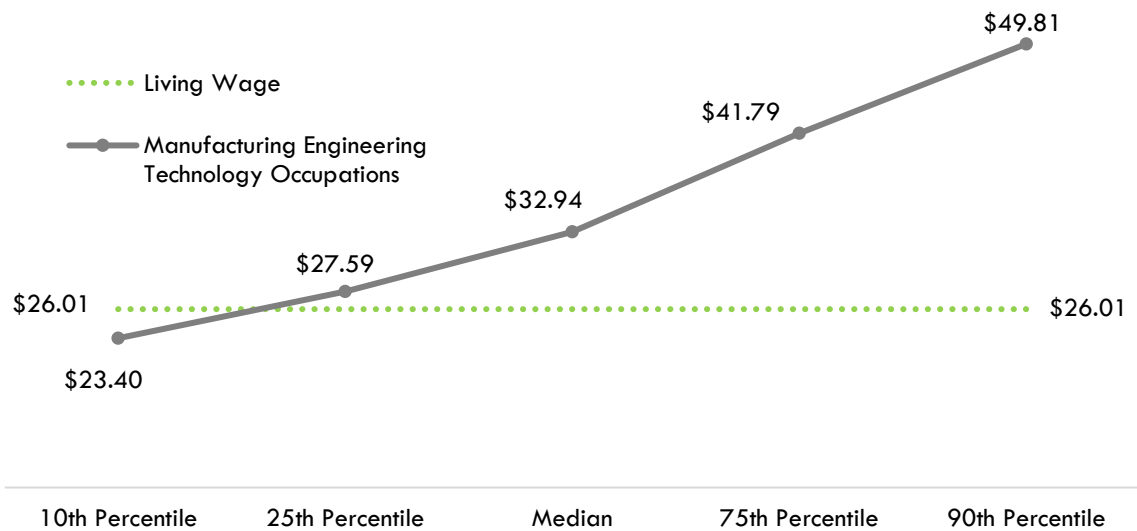
According to traditional<sup>3</sup> labor market information (LMI), entry-level hourly earnings for *Engineering Technology Occupations* range from \$24.55 to \$30.24 (Exhibit 2).

**Exhibit 2: Hourly Earnings for Engineering Technology Occupations in San Diego County<sup>4</sup>**

Occupational Title	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Electrical and Electronic Engineering Technologists and Technicians	\$30.24	\$36.81	\$48.27
Electro-Mechanical and Mechatronics Technologists and Technicians	\$30.24	\$34.35	\$43.97
Industrial Engineering Technologists and Technicians	\$28.29	\$31.38	\$39.14
Mechanical Engineering Technologists and Technicians	\$24.65	\$31.16	\$39.61
Industrial Machinery Mechanics	\$24.55	\$31.02	\$37.94

On average, the entry-level hourly earnings are \$27.59—or \$57,387 annual salary<sup>5</sup>; this is more than the living wage for a single adult in San Diego County, which is \$26.01 per hour (Exhibit 3).<sup>6</sup>

**Exhibit 3: Hourly Earnings<sup>7</sup> for Engineering Technology Occupations in San Diego County<sup>8</sup>**



<sup>3</sup> Traditional LMI is generally historical data captured by the U.S. Bureau of Labor Statistics (BLS) or the California Employment Development Department (EDD). It does not account for recent technological, economic, or legislative changes that may affect labor market demand and wages.

<sup>4</sup> Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

<sup>5</sup> Annualized salaries assume a full-time position with 2,080 hours. Multiplying the hourly wage with 2,080 yields the annual salary.

<sup>6</sup> Center for Women's Welfare, University of Washington. (2024). The self-sufficiency standard for California 2024.

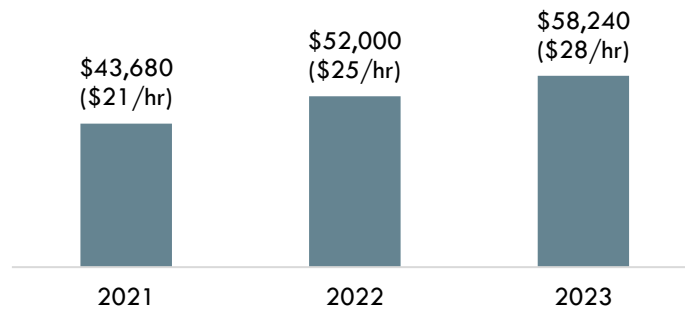
[selfsufficiencystandard.org/California](https://selfsufficiencystandard.org/California).

<sup>7</sup> 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.

<sup>8</sup> Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

Between January 1, 2021 and December 30, 2023, employers advertised between \$21 to \$28 per hour in online job postings for *Engineering Technology Occupations* in San Diego County (Exhibit 4).<sup>9</sup> This suggests that employers in recent years are increasing wages due to labor market forces that may not be captured by traditional LMI.

**Exhibit 4: Median Advertised Salaries in Online Job Postings for Engineering Technology Occupations in San Diego County (2021-2023)\***



\*Hourly wages are rounded to the nearest dollar amount.

## Expected Level of Education

According to traditional LMI, *Engineering Technology Occupations* have a national educational attainment of a high school diploma or equivalent to an associate degree.<sup>10</sup> (Exhibit 5).

**Exhibit 5: National Educational Attainment for Engineering Technology Occupations<sup>11</sup>**

Occupational Title	Typical Entry-Level Education
Electrical and Electronic Engineering Technologists and Technicians	Associate degree
Electro-Mechanical and Mechatronics Technologists and Technicians	Associate degree
Industrial Engineering Technologists and Technicians	Associate degree
Mechanical Engineering Technologists and Technicians	Associate degree
Industrial Machinery Mechanics	High school diploma or equivalent

<sup>9</sup> Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

<sup>10</sup> Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

<sup>11</sup> Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

Similarly, online job postings between January 1, 2021 and December 31, 2023 in San Diego County had a high school diploma or equivalent as the most requested educational requirement for *Engineering Technology Occupations*; however, employers also expected the following certifications (Exhibit 6).<sup>12</sup>

**Exhibit 6: Top Certifications for *Engineering Technology Occupations* in San Diego County in Online Job Postings (2021-2023)<sup>13</sup>**

1. Security Clearance
2. CDL Class C License
3. 10-Hour OSHA General Industry Card
4. Automotive Service Excellence (ASE) Certification
5. CompTIA A+
6. Forklift Certification
7. Cardiopulmonary Resuscitation (CPR) Certification
8. First Aid Certification
9. CompTIA Security+
10. Airframe & Powerplant (A&P) Certificate
11. CDL Class A License
12. EPA 608 Technician Certification
13. CDL Class B License
14. Certified Control Systems Technician
15. CompTIA Network+

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<sup>12</sup> Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

<sup>13</sup> Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

## 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. There are **nine** TOP codes and **23** CIP codes related to *Engineering Technology Occupations* (Exhibit 7).

**Exhibit 7: Related TOP and CIP Codes for Engineering Technology Occupations<sup>14</sup>**

TOP or CIP Code	TOP or CIP Program Title
TOP 0924.00	Engineering Technology, General
TOP 0934.00	Electronics and Electric Technology
TOP 0934.10	Computer Electronics
TOP 0934.20	Industrial Electronics
TOP 0934.40	Electrical Systems and Power Transmission
TOP 0935.00	Electro-Mechanical Technology
TOP 0943.00	Instrumentation Technology
TOP 0945.00	Industrial Systems Technology and Maintenance
TOP 0956.00	Manufacturing and Industrial Technology
CIP 15.0000	Engineering Technology, General
CIP 15.0201	Civil Engineering Technology/Technician
CIP 15.0303	Electrical, Electronic and Communications Engineering Technology/Technician
CIP 15.0306	Integrated Circuit Design
CIP 15.0399	Electrical and Electronic Engineering Technologies/Technicians, Other
CIP 15.0403	Electromechanical Technology/Electromechanical Engineering Technology
CIP 15.0404	Instrumentation Technology/Technician
CIP 15.0405	Robotics Technology/Technician
CIP 15.0406	Automation Engineer Technology/Technician
CIP 15.0611	Metallurgical Technology/Technician
CIP 15.0612	Industrial Technology/Technician
CIP 15.0613	Manufacturing Engineering Technology/Technician
CIP 15.0803	Automotive Engineering Technology/Technician
CIP 15.0805	Mechanical Engineering/Mechanical Technology/Technician
CIP 15.1201	Computer Engineering Technology/Technician

<sup>14</sup> This brief uses a conservative estimate of program supply and only calculates awards from the TOP code listed in Exhibit 7.

CIP 15.1203	Computer Hardware Technology/Technician
CIP 46.0301	Electrical and Power Transmission Installation/Installer, General
CIP 47.0101	Electrical/Electronics Equipment Installation and Repair, General
CIP 47.0104	Computer Installation and Repair Technology/Technician
CIP 47.0105	Industrial Electronics Technology/Technician
CIP 47.0199	Electrical/Electronics Maintenance and Repair Technology, Other
CIP 47.0303	Industrial Mechanics and Maintenance Technology
CIP 50.0404	Industrial and Product Design

According to TOP data, four community colleges supply the region with awards for these occupations: Palomar College, San Diego City, San Diego College of Continuing Education, and Southwestern College. According to CIP data, four non-community-college institutions supply the region with awards: California Institute of Arts & Technology, California Institute of Arts & Technology-National City, National University, and Newschool of Architecture and Design (Exhibit 8).

**Exhibit 8: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions  
(Program Year 2019-20 Through Program Year 2022-23 Average)**

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY20-21 to PY22-23)	Other Educational Institutions 3-Yr Annual Average Awards (PY19-20 to PY21-22)	Total Average Supply (PY19-20 to PY22-23)
0934.00	Electronics and Electric Technology	19	0	19
	San Diego City	1	0	
	• Certificate 16 < 30 units	1	0	
	San Diego Cont. Ed	18	0	
	• Noncredit 480 < 960 hrs	1	0	
	• Noncredit 288 < 480 hrs	17	0	
0934.10	Computer Electronics	1	0	1
	San Diego City	1	0	
	• Associate Degree	1	0	
	Southwestern	0	0	
	• Certificate 6 < 18 units	0	0	



0934.40	Electrical Systems and Power Transmission	14	0	14
	San Diego City	14	0	
	• Associate Degree	5	0	
	• Certificate 30 < 60 units	0	0	
	• Certificate 16 < 30 units	9	0	
0956.00	Manufacturing and Industrial Technology	1	0	1
	Palomar	1	0	
	• Associate Degree	1	0	
15.0000	Engineering Technology, General	0	1	1
	National University	0	1	
	• Associate degree	0	1	
15.0399	Electrical and Electronic Engineering Technologies/Technicians, Other	0	4	4
	National University	0	4	
	• Master's degree	0	4	
47.0104	Computer Installation and Repair Technology/Technician	0	42	42
	California Institute of Arts & Technology	0	36	
	• Certificates < 1 year	0	36	
	California Institute of Arts & Technology-National City	0	6	
	• Certificates < 1 year	0	6	
50.0404	Industrial and Product Design	0	7	7
	Newschool of Architecture and Design	0	7	
	• Bachelor's degree	0	7	
			<b>Total</b>	<b>89</b>

## Demand vs. Supply

Comparing labor demand (annual openings) with labor supply<sup>15</sup> suggests that there is a supply gap for these occupations in San Diego County, with 631 annual openings and 89 awards. Comparatively, there are 6,037 annual openings in California and 3,018 awards, suggesting that there is also a supply gap across the state<sup>16</sup> (Exhibit 9).

**Exhibit 9: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)**

	<b>Demand</b> (Annual Openings)	<b>Supply</b> (Annual Awards)	<b>Supply Gap or Oversupply</b>
San Diego	631	89	542
California	6,037	3,018	3,019

**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.

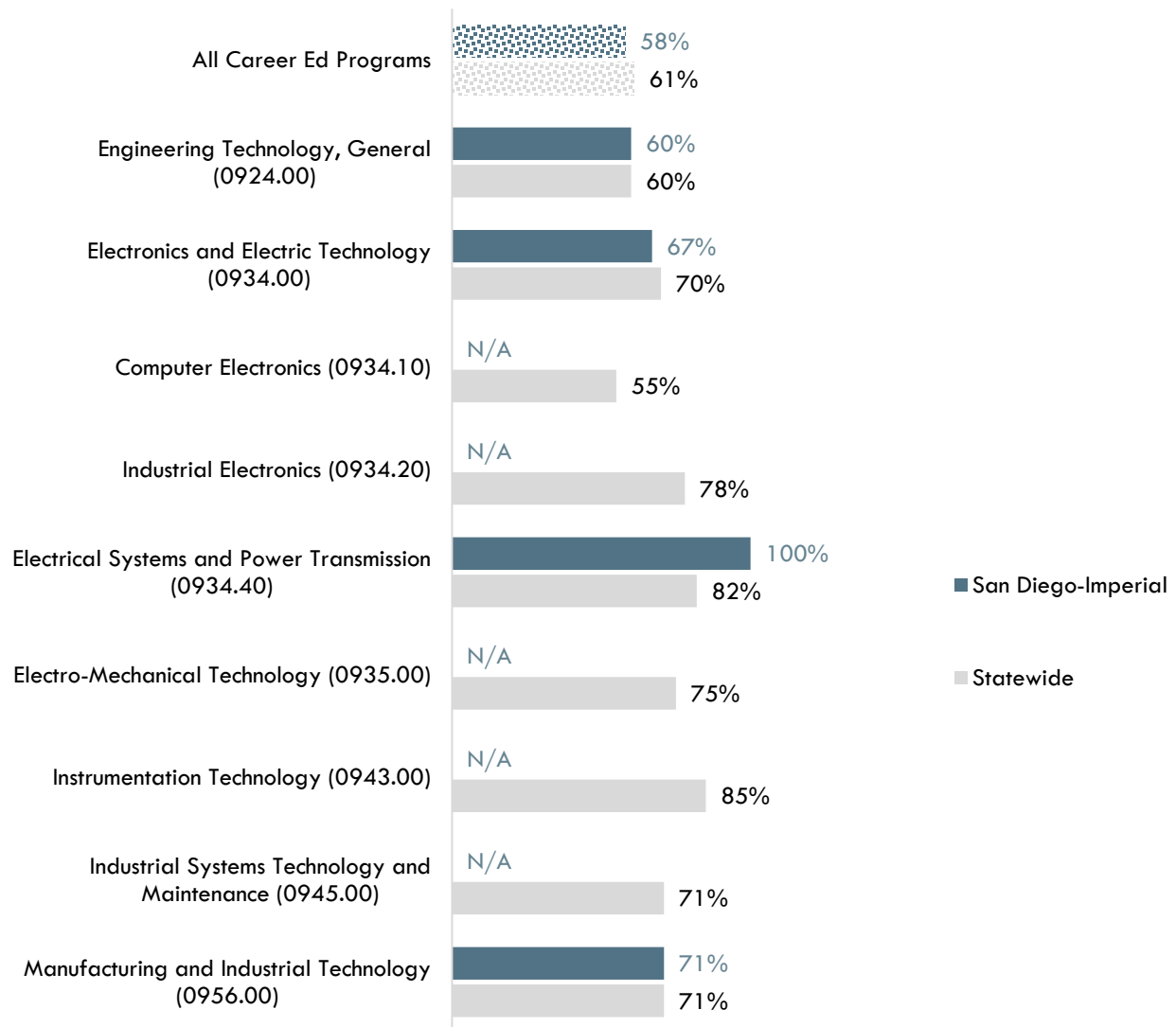
<sup>15</sup> Labor supply can be found from two different sources: Lightcast or the California Community Colleges Chancellor's Office MIS Data Mart. Lightcast uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

<sup>16</sup> "Supply and Demand," Centers of Excellence Student Outcomes, [coecc.net/our-resources](http://coecc.net/our-resources).

## Student Outcomes and Regional Comparisons

According to the California Community Colleges DataVista, 60 to 100 percent of students in the San Diego-Imperial region earned a living wage after completing a program related to *Engineering Technology Occupations*, compared 55 to 85 percent statewide and 61 percent of students in Career Education programs in general across the state (Exhibit 10).<sup>17</sup>

**Exhibit 10: Percentage of Students Who Earned a Living Wage by Program, PY2021-22<sup>18</sup>**



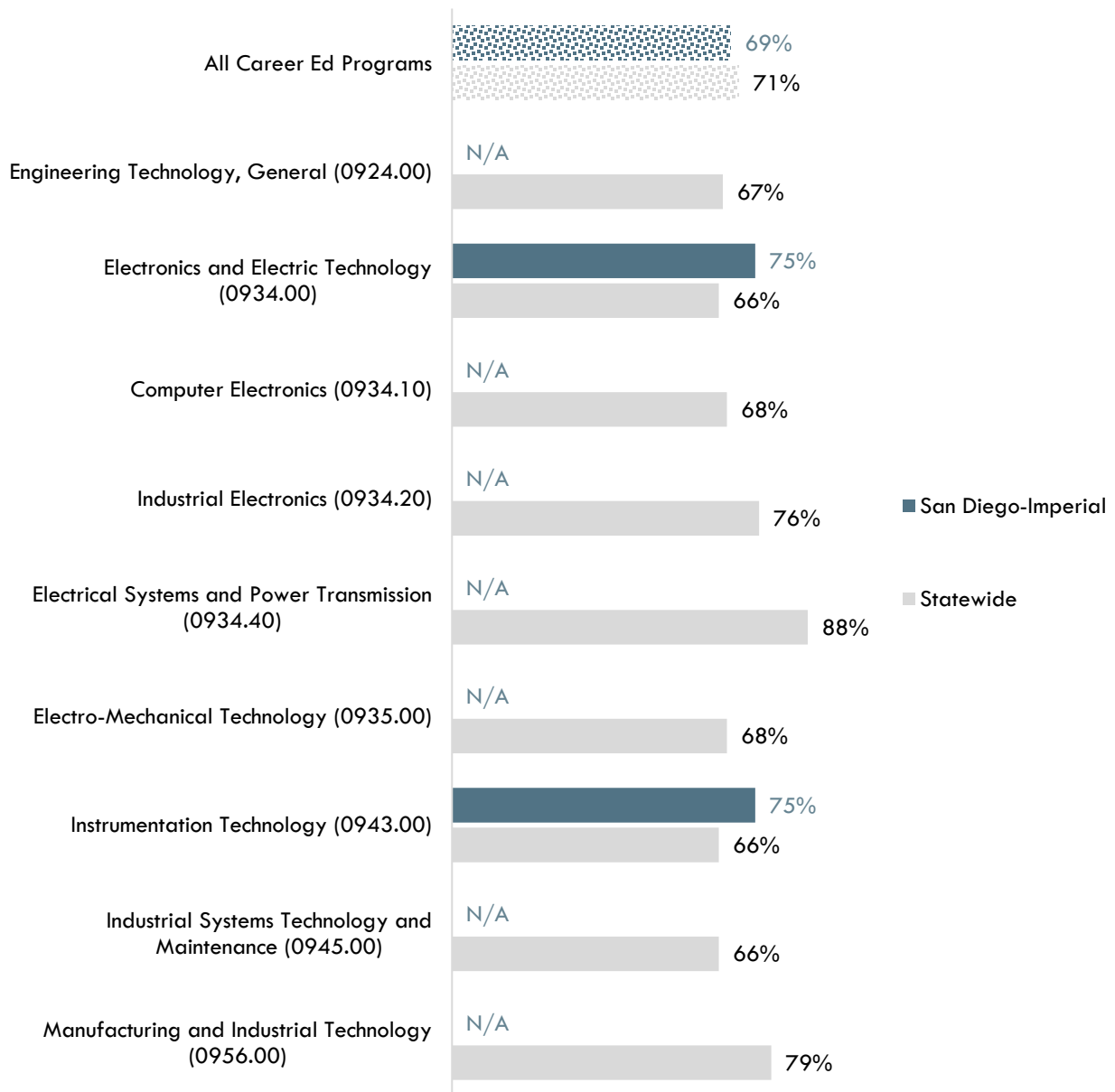
"N/A" indicates insufficient data

<sup>17</sup> DataVista, California Community Colleges, [datavista.cccco.edu/](http://datavista.cccco.edu/).

<sup>18</sup> Most recent year with available data is Program Year 2021-22. Among completers and skills builders who exited, the percentage of students who attained a living wage.

According to the California Community Colleges DataVista, 75 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a program related to *Engineering Technology Occupations*, compared to 66 to 88 percent statewide and 71 percent of students in Career Education programs in general across the state (Exhibit 11).<sup>19</sup>

**Exhibit 11: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2020-21<sup>20</sup>**



"N/A" indicates insufficient data

<sup>19</sup> DataVista, California Community Colleges, [datavista.cccco.edu/](http://datavista.cccco.edu/).

<sup>20</sup> Most recent year with available data is Program Year 2020-21. 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.

## Employers

Between January 1, 2021 and December 31, 2023, the top five employers in San Diego County for *Engineering Technology Occupations* were [Aerotek](#), [Northrop Grumman](#), [General Atomics](#), [Actalent](#), and [Kelly Services](#) based on online job postings (Exhibit 12).

**Exhibit 12: Top Employers for Engineering Technology Occupations in San Diego County<sup>21</sup>**

Top Employers	
<ul style="list-style-type: none"> <li>• Aerotek</li> <li>• Northrop Grumman</li> <li>• General Atomics</li> <li>• Actalent</li> <li>• Kelly Services</li> </ul>	<ul style="list-style-type: none"> <li>• Epsilon Systems</li> <li>• Volt</li> <li>• Randstad</li> <li>• Thermo Fisher Scientific</li> <li>• Danaher</li> </ul>

## Skills

Exhibit 13 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2021 and December 31, 2023.

**Exhibit 13: Top Skills for Engineering Technology Occupations in San Diego County<sup>22</sup>**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> <li>• Good Manufacturing Practices</li> <li>• Hand Tools</li> <li>• Test Equipment</li> <li>• Standard Operating Procedure</li> <li>• Power Tool Operation</li> <li>• Machinery</li> <li>• Electronics</li> <li>• Automation</li> <li>• Manufacturing Processes</li> <li>• Calibration</li> <li>• Soldering</li> <li>• Preventive Maintenance</li> <li>• Electrical Wiring</li> <li>• Blueprinting</li> <li>• Electromechanics</li> </ul>	<ul style="list-style-type: none"> <li>• Troubleshooting</li> <li>• Communication</li> <li>• Operations</li> <li>• Detail Oriented</li> <li>• Lifting Ability</li> <li>• Management</li> <li>• Packaging And Labeling</li> <li>• Microsoft Excel</li> <li>• Problem Solving</li> <li>• Computer Literacy</li> <li>• Customer Service</li> <li>• Writing</li> <li>• Microsoft Office</li> <li>• Self-Motivation</li> <li>• Leadership</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft Excel</li> <li>• Microsoft Word</li> <li>• Microsoft Outlook</li> <li>• Microsoft PowerPoint</li> <li>• SAP Applications</li> <li>• Disassembler</li> <li>• Spreadsheets</li> <li>• SolidWorks</li> <li>• Microsoft Access</li> <li>• Python</li> <li>• DeltaV Distributed Control System</li> <li>• Microsoft Windows XP</li> <li>• Inventory Control Systems</li> <li>• LabVIEW</li> <li>• Linux</li> </ul>

<sup>21</sup> Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

<sup>22</sup> Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

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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.