










Welding Technology

Labor Market Analysis for San Diego College of Continuing Education

September 2021

Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED EDUCATION FOR MAJORITY OF OCCUPATIONS ANALYZED
 Proceed with Caution	 	 	<input type="checkbox"/> Bachelor's Degree ⁺ <input 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
SUPPORT FOR PROGRAM MODIFICATION?	NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING	NUMBER OF ANNUAL JOB OPENINGS	
 	<div>LOW</div> 	<div>HIGH</div> 	

This report provides labor market information for occupations selected by San Diego College of Continuing Education for its *Welding Technology* program. These occupations include “Welders, Cutters, Solderers, and Brazers” and “Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders.” According to available labor market information, *Welding Technology Occupations* in San Diego County have a labor market demand of 439 annual job openings (while average demand for a single occupation in San Diego County is 242 annual job openings). On average, one institution supplies 60 for-credit awards and one institution supplies 35 noncredit awards in San Diego County for these occupations. In short, the region supplies 95 for-credit and noncredit awards for 439 annual job openings, suggesting that there is a supply gap in the labor market. Entry-level are below the living wage for these occupations, but median earnings are above the living wage. This brief recommends proceeding with caution when developing a new program and supports a program modification because 1) there is a supply gap; 2) there is a high number of annual job openings; and 3) entry-level wages are below the living wage, but median wages are above the living wage.

Introduction

This report provides labor market information in San Diego County for occupations related to the six-digit Taxonomy of Programs (TOP)¹ code, Welding Technology (TOP 0956.50). The purpose of this brief is to assist noncredit program providers in the region, such as San Diego College of Continuing Education (SDCCE), with program development and review. SDCCE identified the following occupational codes from the Standard Occupational Classification (SOC)² system for *Welding Technology*, which will be the focus of this report:

- **Welders, Cutters, Solderers, and Brazers** (SOC 51-4121): Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.
- **Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders** (SOC 51-4122): Set up, operate, or tend welding, soldering, or brazing machines or robots that weld, braze, solder, or heat treat metal products, components, or assemblies. Includes workers who operate laser cutters or laser-beam machines.

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

¹ Taxonomy of Programs (TOP) is a system of codes used by the California Community Colleges for the purpose of collecting, calculating, or disseminating data about similar training programs.

² 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 2020 and 2025, *Welding Technology Occupations* are projected to increase by **60** net jobs or **one** percent (Exhibit 1a). Employers in San Diego County will need to hire **439** workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

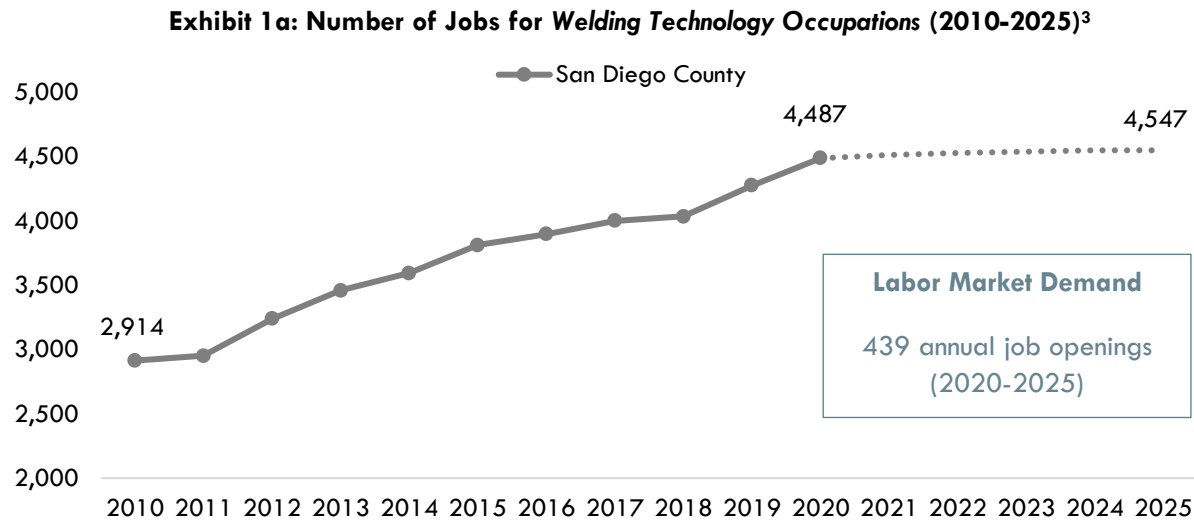


Exhibit 1b disaggregates the projected number of jobs change by occupation. “Welders, Cutters, Solderers, and Brazers” are projected to have the most labor market demand between 2020 and 2025, with **425** annual job openings.

Exhibit 1b: Number of Jobs for Welding Technology Occupations in San Diego County (2020-2025)⁴

Occupational Title	2020 Jobs	2025 Jobs	2020 - 2025 Net Jobs Change	2020-2025 % Net Jobs Change	Annual Job Openings (Demand)
Welders, Cutters, Solderers, and Brazers	4,345	4,404	59	1%	425
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	142	143	1	1%	14
Total	4,487	4,547	60	1%	439

³ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

⁴ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

Earnings

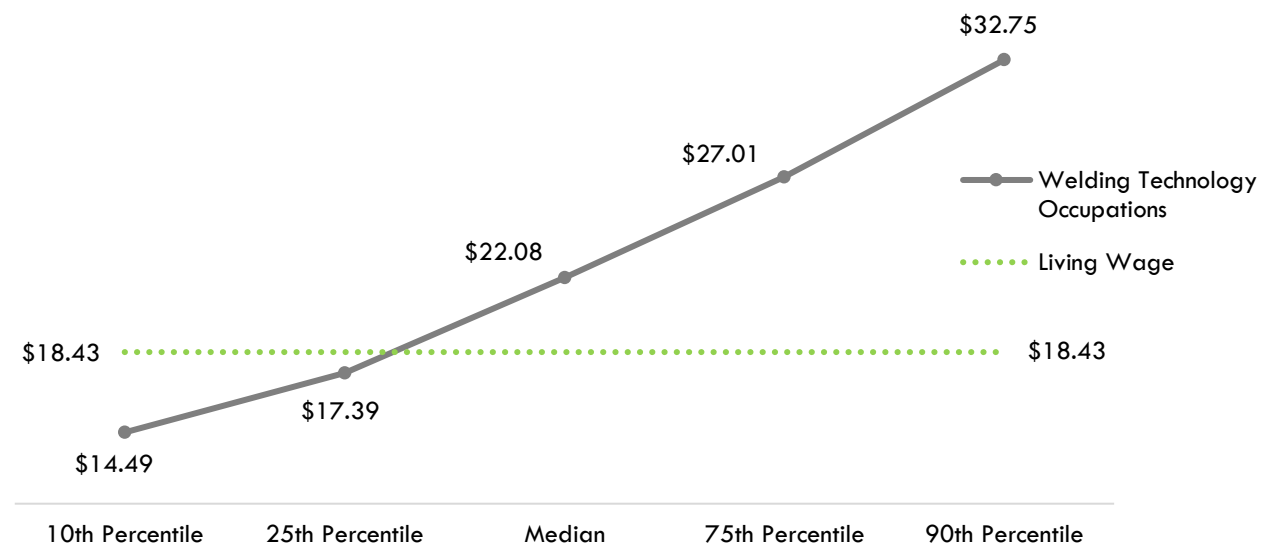
Exhibit 2a disaggregates hourly earnings by occupation. The entry-level hourly earnings for *Welding Technology Occupations* range from \$15.16 to \$19.62.

Exhibit 2a: Hourly Earnings for *Welding Technology Occupations* in San Diego County⁵

Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Welders, Cutters, Solderers, and Brazers	\$19.62	\$25.27	\$30.40
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	\$15.16	\$18.90	\$23.61

On average, the entry-level hourly earnings for *Welding Technology Occupations* are \$17.39; this is less than the living wage for a single adult in San Diego County, which is \$18.43 per hour (Exhibit 2b).⁶

Exhibit 2b: Average Hourly Earnings⁷ for *Welding Technology Occupations* in San Diego County⁸



⁵ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

⁶ "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightccd.org/family-needs-calculator/.

⁷ 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.

⁸ EMSI 2021.2; 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.⁹ According to TOP and CIP¹⁰ data, **one** community college supplies the region with for-credit awards for Welding Technology (TOP 0956.50): **Palomar College** (Exhibit 3a).

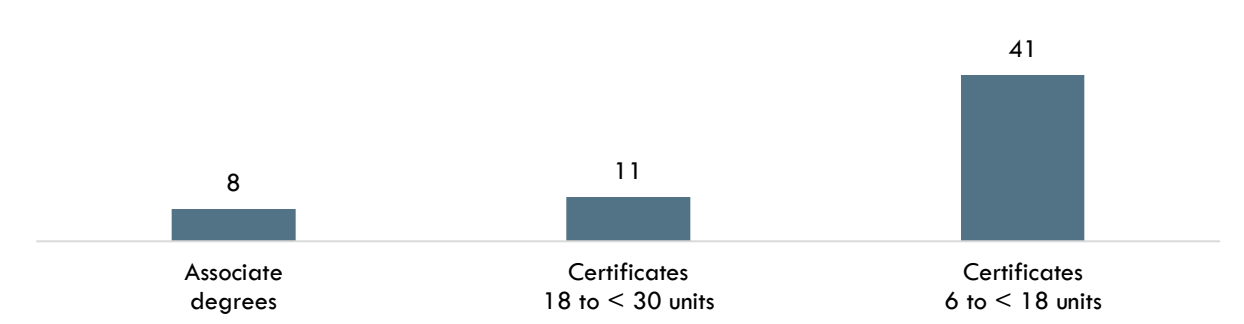
Exhibit 3a: Number of For-Credit Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Years 2017-18 through 2019-20)

College	Award Type	PY 17-18	PY 18-19	PY 19-20	3-Yr Total Average
Palomar	Associate Degree	10	13	2	8
	Certificate 18 to < 30 units	10	22	0	11
	Certificate 6 to < 18 units	37	54	33	41
Total		57	89	35	60

Note: The numbers may not add up due to rounding.

By for-credit award type, the college supplied the most awards for **certificates 6 to < 18 units** based on the three-year average (program years 2017-18 through 2019-20) (Exhibit 3b).

Exhibit 3b: Total Number of For-credit Awards by Type for Welding Technology (TOP 0956.50) in San Diego County (3-Yr Average)



⁹ 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).

¹⁰ There are three CIP codes related to Welding Technology (TOP 0956.50): Welding Engineering Technology/Technician (CIP 15.0614), Welding Technology/Welder (CIP 48.0508), and Metal Fabricator (CIP 48.0511).

In terms of noncredit awards, only San Diego College of Continuing Education provides noncredit awards for Welding Technology (TOP 0956.50), with a three-year average of 35 noncredit awards (program years 2017-18 through 2019-20) (Exhibit 4).

**Exhibit 4: Number of Noncredit Awards Conferred by SDCCE
(Program Years 2017-18 through 2019-20)**

Program Title	Award Type	PY 17-18	PY 18-19	PY 19-20	3-Yr Total Average
Gas Metal and Flux Cored Arc Welding	Noncredit	14	8	5	9
Gas Tungsten Arc Welding	Noncredit	2	1	3	2
Pipe Welding	Noncredit	1	2	1	1
Shielded Metal Arc Welding	Noncredit	37	24	6	22
Total		54	35	15	35*

Note: The numbers may not add up due to rounding.

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply¹¹ suggests that there is a supply gap in San Diego County, with 439 annual openings and 95 for-credit and noncredit awards supplied by the region (Exhibit 5).

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

TOP6 Program	Demand (Annual Openings)	Supply (Total Annual Average Supply)		Supply Gap or Oversupply
		Noncredit	For-Credit	
Welding Technology (TOP 0956.50)	439	35	60	344

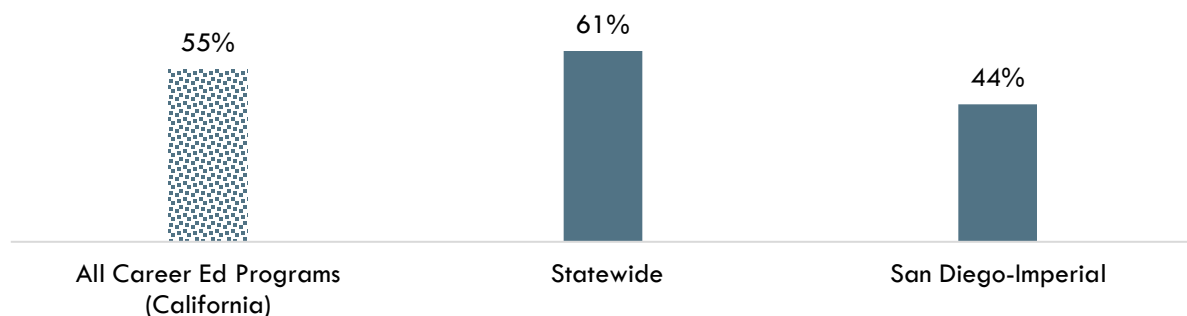
Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers;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

¹¹ 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.

Student Outcomes and Regional Comparisons

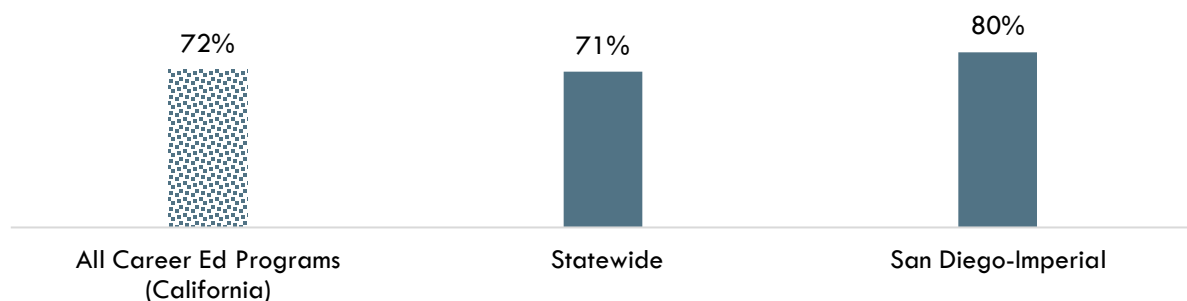
According to the California Community Colleges LaunchBoard, 44 percent of students in the San Diego-Imperial region earned a living wage after completing a Welding Technology (TOP 0956.50) program, compared to 61 percent statewide and 55 percent of students in Career Education programs in general across the state (Exhibit 6a).¹²

Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program
(Welding Technology, PY 2017-18)¹³



According to the California Community Colleges LaunchBoard, 80 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a Welding Technology (TOP 0956.50) program, compared to 71 percent statewide and 72 percent of students in Career Education programs in general across the state (Exhibit 6b).¹⁴

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program
(Welding Technology, PY 2016-17)¹⁵



¹² "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹³ Among completers and skills builders who exited, the proportion of students who attained a living wage.

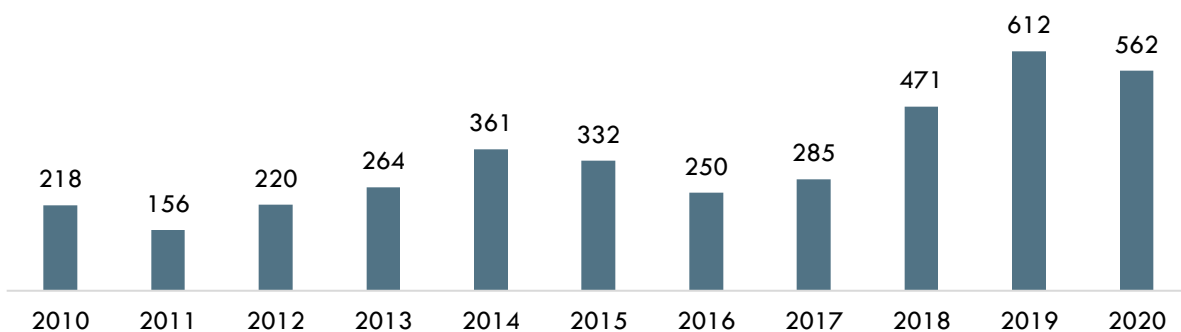
¹⁴ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹⁵ Most recent year with available data is Program Year 2016-17. 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 2010 and 2020, there was an average of 339 online job postings per year for *Welding Technology Occupations* 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 1b). Employers may post a position multiple times for various reasons, such as increasing the pool of applicants, for example.

Exhibit 7: Number of Online Job Postings for Welding Technology Occupations in San Diego County (2010-2020)¹⁶



Top Employers

Between January 1, 2018 and December 31, 2020, the top five employers in San Diego County for *Welding Technology Occupations* were General Dynamics, L3Harris Technologies, BAE Systems, Epsilon Systems Solutions, and Propulsion Controls Engineering based on online job postings (Exhibit 8).

Exhibit 8: Top Employers for Welding Technology Occupations in San Diego County¹⁷

Top Employers	
• General Dynamics	• Serco
• L3Harris Technologies	• Ameri-Force Craft Services, Inc.
• BAE Systems	• GKN
• Epsilon Systems Solutions, Inc.	• NuVasive, Inc.
• Propulsion Controls Engineering	• U.S. Government

¹⁶ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2020.

¹⁷ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

Education, Skills, and Certifications

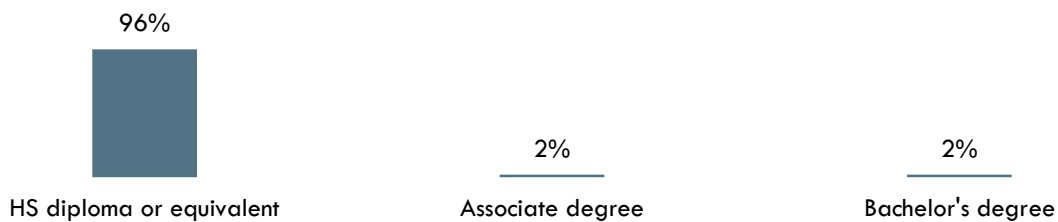
Welding Technology Occupations have a national educational attainment of a [high school diploma or equivalent](#) (Exhibit 9a).

Exhibit 9a: National Educational Attainment for *Welding Technology Occupations*¹⁸

Occupational Title	Typical Entry-Level Education
Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	High school diploma or equivalent

Based on online job postings between January 1, 2018 and December 31, 2020 in San Diego County, employers posted a [high school diploma or equivalent](#) as the educational requirement for *Welding Technology Occupations* (Exhibit 9b).¹⁹

Exhibit 9b: Educational Requirements for *Welding Technology Occupations* in San Diego County²⁰



*may not total 100 percent due to rounding

¹⁸ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

¹⁹ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

²⁰ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified April 9, 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, 2018 and December 31, 2020.

Exhibit 10: Top Skills for Welding Technology Occupations in San Diego County²¹

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Welding • Repair • Mig and Tig Welding • Hand Tools • Shielded Metal Arc Welding • Gas-metal Arc Welding • Welding Equipment • Flux Core Welding • Gas-tungsten Arc Welding • Occupational Health and Safety • Power Tools • Arc Welding • Pipe Welding • Deal Structuring • Personal Protective Equipment 	<ul style="list-style-type: none"> • Physical Abilities • English • Communication Skills • Troubleshooting • Detail-Oriented • Problem Solving • Work Area Maintenance • Writing • Preventive Maintenance • Computer Literacy • Teamwork / Collaboration • Organizational Skills • Leadership • Planning • Written Communication 	<ul style="list-style-type: none"> • Microsoft Excel • Active Server Pages • Microsoft Word • Enterprise Resource Planning • ISO 9000 • C4ISR • Microsoft Access • Microsoft Project • Adobe Photoshop • Extensible Markup Language • Facebook • SAP • .NET • Computer Aided Drafting/Design • Database Software

²¹ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

Exhibit 11 lists the top certifications that appeared in online job postings between January 1, 2018 and December 31, 2020.

Exhibit 11: Top Certifications for *Welding Technology Occupations* in San Diego County²²

Top Certifications in Online Job Postings

1. Welding Certification
2. OSHA Safety 10 Hour
3. Security Clearance
4. Occupational Safety and Health Administration Certification
5. IPC Certification
6. Competent Person Certification
7. Certified Welding Inspector (CWI)
8. Hazardous Materials Certification
9. American Board of Surgery Certification (ABS)
10. ISO 9000 Quality Management
11. American Society of Mechanical Engineers (ASME) Certified
12. Sheet Metal Certification
13. The American Society For Nondestructive Testing (ASNT) Certification
14. 6-G Certified
15. First Aid CPR AED

²² Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

Prepared by:

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

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

Priscilla Fernandez, Research Analyst (pfernandez@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.