










Manufacturing and Industrial 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 LEVEL OF EDUCATION
 <p>Proceed with Caution</p>	 	 	<ul style="list-style-type: none"> <input type="checkbox"/> Bachelor's Degree+ <input type="checkbox"/> Associate Degree <input checked="" 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> 	

This report provides labor market information for an occupation selected by San Diego College of Continuing Education for its *Manufacturing and Industrial Technology* program. The training provided by this program is likely to lead to employment as *Computer Numerically Controlled Machine Tool Programmers*. According to available labor market information, *Computer Numerically Controlled Machine Tool Programmers* in San Diego County have a labor market demand of 23 annual job openings (while average demand for a single occupation in San Diego County is 242 annual job openings). On average, one institution supplies 14 for-credit awards and one institution supplies zero noncredit awards in San Diego County for this occupation. In short, the region supplies 14 for-credit and noncredit awards for 23 annual job openings, suggesting that there is a supply gap in the labor market. Entry-level wages and median wages for this occupation are above the living wage. This brief recommends proceeding with caution when developing a new program because there is a low number of annual job openings, but supports a program modification because 1) there is a small supply gap in the region; and 2) entry-level and median wages are above the living wage.

Introduction

This report provides labor market information in San Diego County for an occupation related to the six-digit Taxonomy of Programs (TOP)¹ code, Manufacturing and Industrial Technology (TOP 0956.00). The purpose of this brief is to assist noncredit program providers in the region, such as San Diego College of Continuing Education (SDCE), with program development and review. SDCE identified one occupation from the Standard Occupational Classification (SOC)² system for *Manufacturing and Industrial Technology*, which will be the focus of this report:

Computer Numerically Controlled Tool Programmers (SOC 51-9162): Develop programs to control machining or processing of materials by automatic machine tools, equipment, or systems. May also set up, operate, or maintain equipment. Sample reported job titles include:

- Computer Numerical Control Programmer
- Programmer
- Computer Numerical Control Machinist
- Process Engineer
- Computer Numerical Control Machining Center Operator
- Machine Shop Lead Man
- Computer Numerical Control Operator
- Machining Manager
- Machine Operator
- Computer Numerical Control Machine Operator

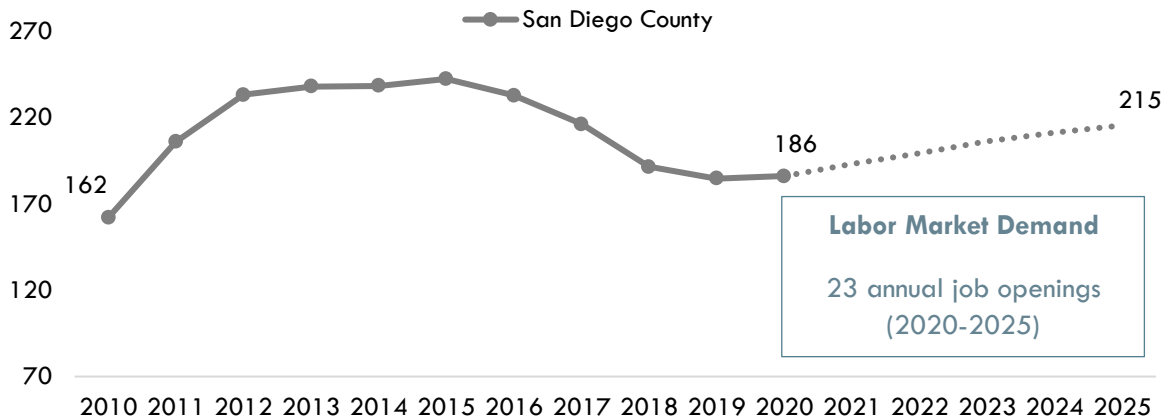
¹ Taxonomy of Programs (TOP) is a system of codes used by the California Community Colleges for the purpose of collecting, calculating, or disseminating data about similar training programs.

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.

Projected Occupational Demand

Between 2020 and 2025, *Computer Numerically Controlled Machine Tool Programmers* are projected to increase by 29 net jobs or 16 percent (Exhibit 1). Employers in San Diego County will need to hire 23 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 Computer Numerically Controlled Machine Tool Programmers (2010-2025)³

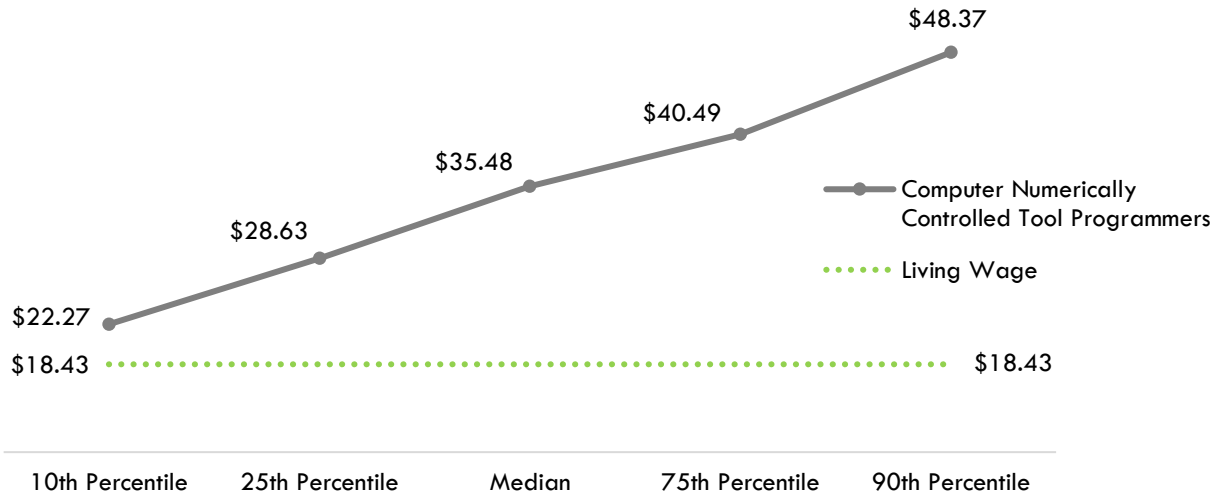


³ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

Earnings

Computer Numerically Controlled Machine Tool Programmers receive entry-level hourly earnings of \$28.63; this is more than the living wage for a single adult in San Diego County, which is \$18.43 per hour (Exhibit 2).⁴

Exhibit 2: Hourly Earnings⁵ for Computer Numerically Controlled Machine Tool Programmers in San Diego County⁶



⁴ "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightccd.org/family-needs-calculator/.

⁵ 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.

⁶ 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.⁷ According to TOP and CIP⁸ data, **one** community college supplies the region with for-credit awards for Manufacturing and Industrial Technology (TOP 0956.00): **San Diego City College** (Exhibit 3a).

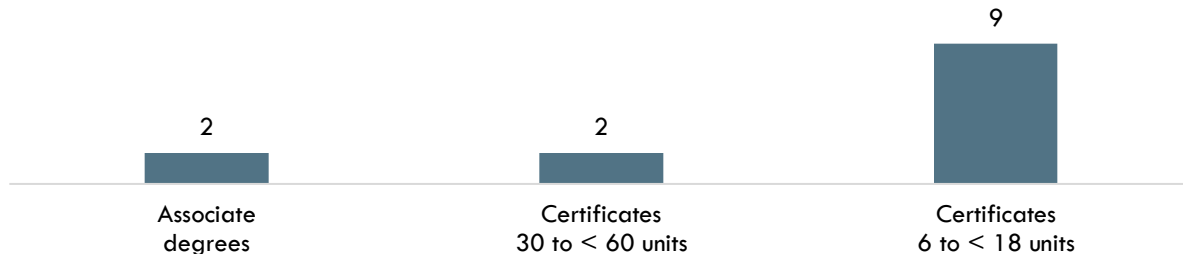
Exhibit 3a: Number of For-Credit Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Years 2017-18 through 2019-20)

College	Award Type	PY 17-18	PY 18-19	PY 19-20	3-Yr Total Average
San Diego City	Associate Degree	4	1	2	2
	Certificate 30 to < 60 units	2	2	2	2
	Certificate 6 to < 18 units	23	5	0	9
Total		29	8	4	14*

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

By for-credit award type, the colleges 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 Manufacturing and Industrial Technology (TOP 0956.00) in San Diego County (3-Yr Average)



⁷ 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).

⁸ There are seven CIP codes related to Manufacturing and Industrial Technology (TOP 0956.00): Robotics Technology/Technician (CIP 15.0405), Automation Engineer Technology/Technician (CIP 15.0406), Metallurgical Technology/Technician (CIP 15.0611), Manufacturing Engineering Technology/Technician (CIP 15.0613), Automotive Engineering Technology/Technician (CIP 15.0803), Mechanical Engineering/Mechanical Technology/Technician (CIP 15.0805), and Industrial and Product Design (CIP 50.0404).

In terms of noncredit awards, only San Diego College of Continuing Education provides noncredit awards for Manufacturing and Industrial Technology (TOP 0956.00), with a three-year average of zero noncredit awards (program years 2017-18 through 2019-20) (Exhibit 4).

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

Program Title	Award Type	PY 17-18	PY 18-19	PY 19-20	3-Yr Total Average
Pipe Welding/Pipe Fitting Program	Noncredit	0	0	0	0
Steel Fabrication Program	Noncredit	0	0	0	0
Total		0	0	0	0

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply⁹ suggests that there is a supply gap in San Diego County, with 23 annual openings and 14 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	
Manufacturing and Industrial Technology (TOP 0956.00)	23	0	14	9

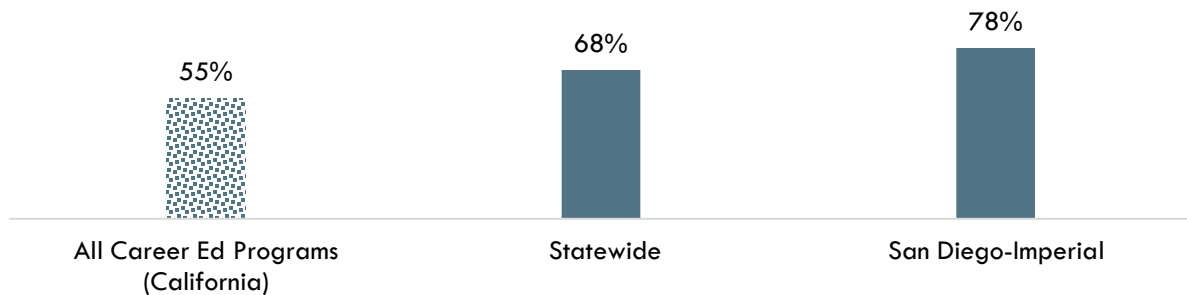
Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers;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

⁹ 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

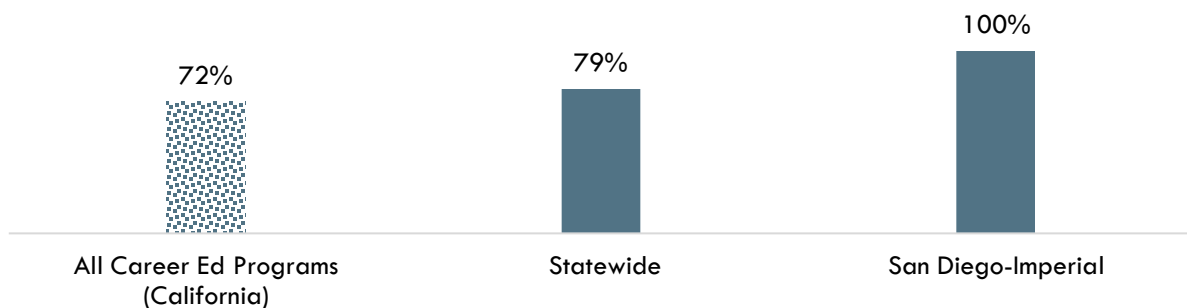
According to the California Community Colleges LaunchBoard, 78 percent of students in the San Diego-Imperial region earned a living wage after completing a Manufacturing and Industrial Technology (TOP 0956.00) program, compared to 68 percent statewide and 55 percent of students in Career Education programs in general across the state (Exhibit 6a).¹⁰

**Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program
(Manufacturing and Industrial Technology, PY 2017-18)¹¹**



According to the California Community Colleges LaunchBoard, 100 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a Manufacturing and Industrial Technology (TOP 0956.00) program, compared to 79 percent statewide and 72 percent of students in Career Education programs in general across the state (Exhibit 6b).¹²

**Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program
(Manufacturing and Industrial Technology, PY 2016-17)¹³**



¹⁰ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹¹ Among completers and skills builders who exited, the proportion of students who attained a living wage.

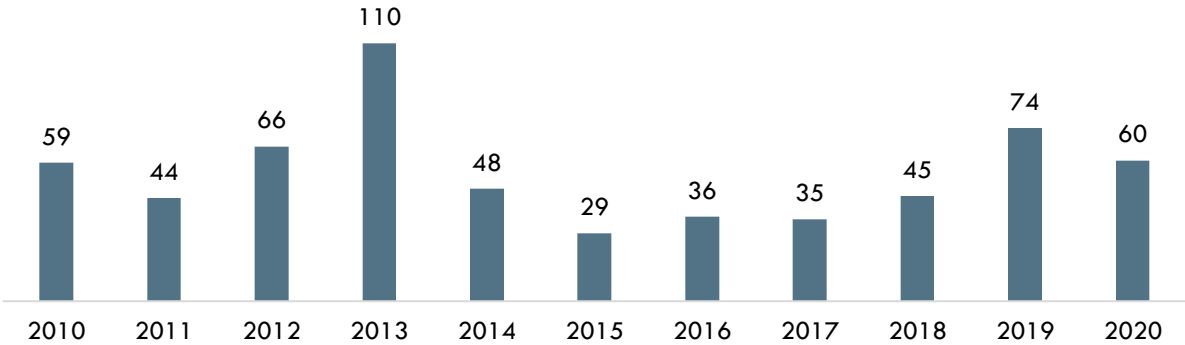
¹² "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹³ 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 55 online job postings per year for *Computer Numerically Controlled Machine Tool Programmers* 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). 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 Computer Numerically Controlled Machine Tool Programmers in San Diego County (2010-2020)¹⁴



¹⁴ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2020.

Top Employers

Between January 1, 2018 and December 31, 2020, the top five employers in San Diego County for this occupation were [General Atomics](#), [Means Engineering](#), [TE Connectivity](#), [GKN](#), and [Rock West](#) based on online job postings (Exhibit 8).

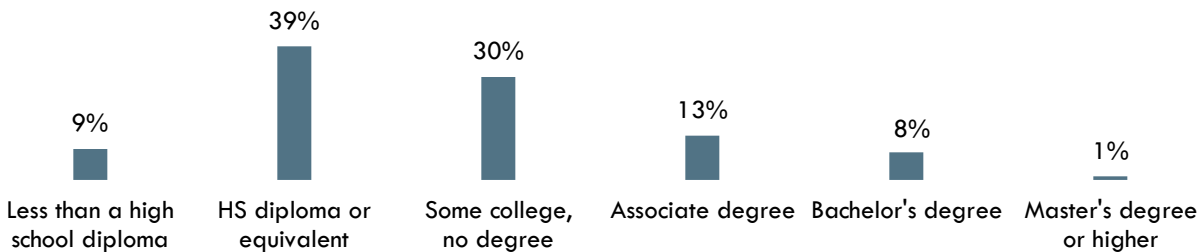
Exhibit 8: Top Employers for Computer Numerically Controlled Machine Tool Programmers in San Diego County¹⁵

Top Employers	
<ul style="list-style-type: none"> • General Atomics • Means Engineering • TE Connectivity • GKN • Rock West 	<ul style="list-style-type: none"> • Epsilon Systems Solutions, Inc. • Luxon MX • Coast Precision Enterprises • Cubic Corporation • Distinctive Plastics, Inc.

Education, Skills, and Certifications

Exhibit 9 indicates the educational attainment for this occupation found currently in the national labor force. The typical entry-level education is a [postsecondary non-degree award](#).¹⁶

Exhibit 9: National Educational Attainment of Computer Numerically Controlled Machine Tool Programmers¹⁷



*may not total 100 percent due to rounding

¹⁵ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

¹⁶ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

¹⁷ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified April 4, 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 Computer Numerically Controlled Machine Tool Programmers
in San Diego County¹⁸**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Computer Numerical Control • Machining • Mastercam • Lathes • Geometry • Machine Tools • Technical Drawings • Trigonometry • Computer-Aided Manufacturing • SolidWorks • Engineering Drawings • Micrometers • Calipers • Cleaning • Object-Oriented Analysis and Design 	<ul style="list-style-type: none"> • Detail-Oriented • Troubleshooting • Communication Skills • Computer Literacy • Problem Solving • Teamwork / Collaboration • Organizational Skills • English • Editing • Self-Starter • Physical Abilities • Tool Selection • Written Communication • Time Management • Writing 	<ul style="list-style-type: none"> • SolidWorks • CATIA • Microsoft Excel • Computer Aided Drafting/Design • AutoCAD • Enterprise Resource Planning • Microsoft PowerPoint • Microsoft Word • SAP • Surfcam • CSS • HTML5 • JavaScript • Model-View-Controller • Unigraphics

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 Computer Numerically Controlled Machine Tool Programmers
in San Diego County¹⁹**

Top Certifications in Online Job Postings
<ol style="list-style-type: none"> 1. Security Clearance 2. Programming Certification 3. Personal Fitness Trainer Certification 4. CNC Machine Operator 5. CNC Machine Programming 6. North American Defense Contractors Accreditation Program (NAD-CAP)

¹⁸ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.
¹⁹ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

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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.