

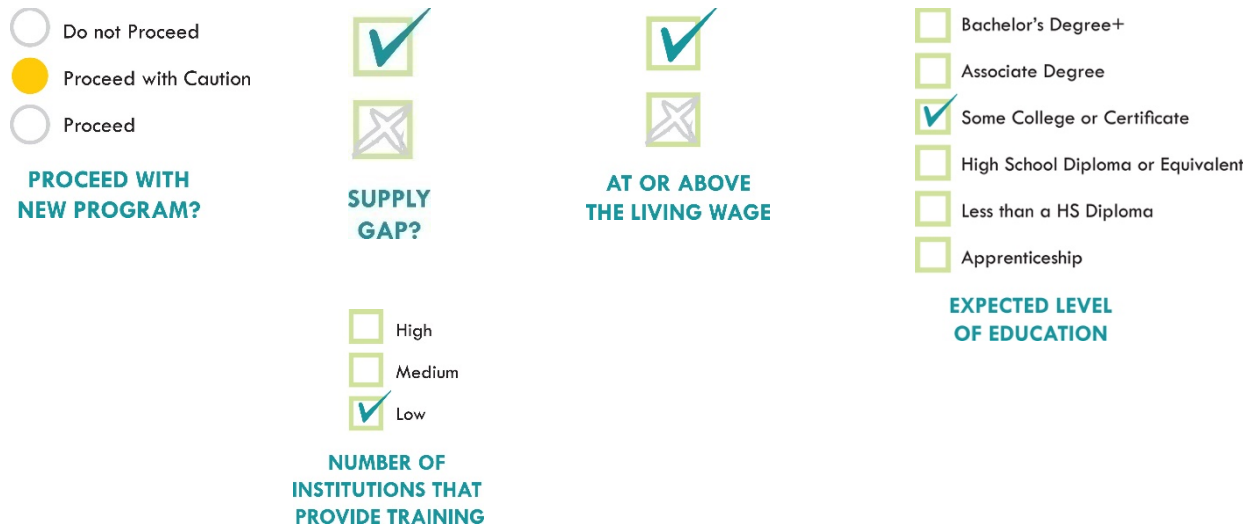
# Manufacturing and Industrial Technology

## Labor Market Analysis for San Diego Continuing Education

September 2019

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### Summary



This report provides labor market information for occupation(s) selected by San Diego 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, Metal and Plastic*. According to available labor market information, the occupation has a labor market demand of 28 annual job openings, while average demand for an occupation in San Diego County is 277 annual job openings. One community college supplies the region with 16 for-credit awards: San Diego City College. San Diego City College awarded 13 certificates with 6 to < 18 units, two associate degrees, and one certificate with units 30 to < 60 units. Only San Diego Continuing Education supplies noncredit awards; however, the institution has not conferred any awards during the past three years. This brief recommends to proceed with caution because 1) there is a very small number of annual job openings, and 2) the region supplies 16 for-credit and noncredit awards for 28 annual job openings, suggesting that there is a small supply gap. However, entry-level and median wages are above the living wage, suggesting that students who successfully complete a program and obtain employment in a related field may earn a living wage. Expected level of education for this occupation is a postsecondary nondegree award.

## Introduction

This report provides labor market information (LMI) in San Diego County for occupations related to the six-digit Taxonomy of Programs<sup>1</sup> (TOP) code, Manufacturing and Industrial Technology (TOP 095600). The purpose of this brief is to assist noncredit program providers in the region, such as San Diego Continuing Education (SDCE), with program development and review. SDCE identified one occupation from the Standard Occupational Classification (SOC)<sup>2</sup> system for *Manufacturing and Industrial Technology*, which will be the focus of this report:

### **Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic (SOC 51-4012):**

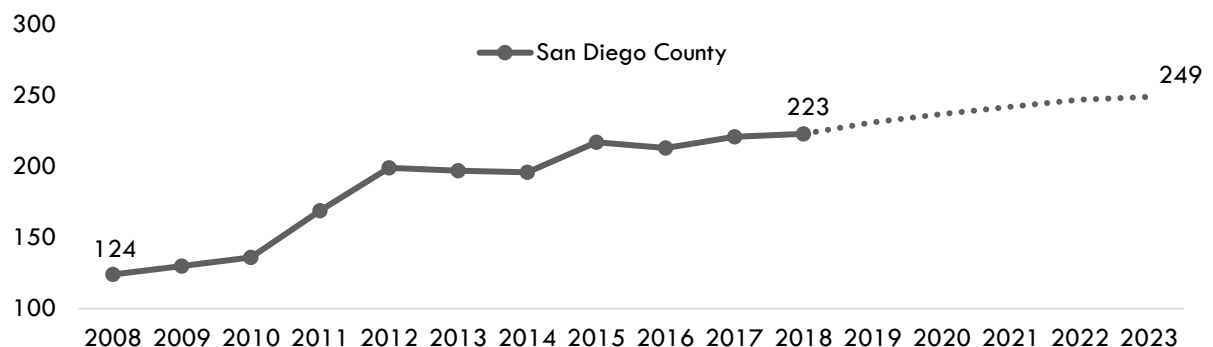
Develop programs to control machining or processing of metal or plastic parts by automatic machine tools, equipment, or systems. Sample reported job titles include:

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

## Projected Occupational Demand

Between 2018 and 2023, *Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic* are projected to increase by 26 net jobs or 12 percent (Exhibit 1). Employers in San Diego County will need to hire 28 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, Metal and Plastic (2008-2023)<sup>3</sup>**



<sup>1</sup> 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.

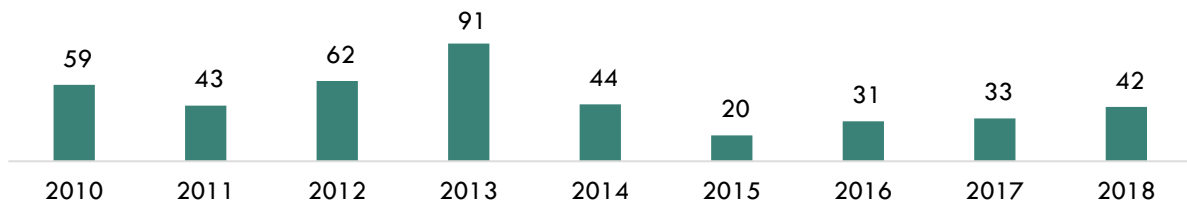
<sup>2</sup> The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc).

<sup>3</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

## 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 demand that are not captured by historical data. Between 2010 and 2018, there was an average of 47 online job postings per year for *Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic* in San Diego County (Exhibit 2).

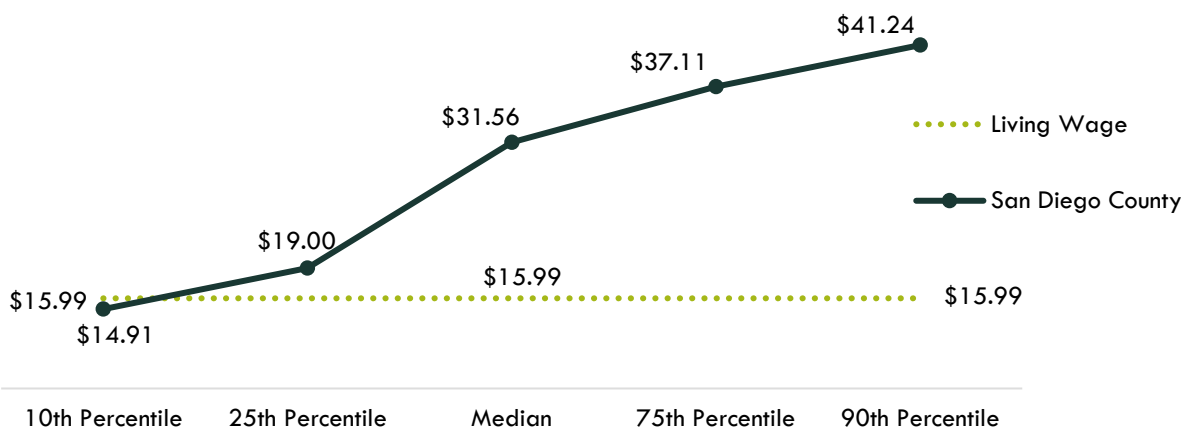
**Exhibit 2: Number of Online Job Postings for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic in San Diego County (2010-2018)<sup>4</sup>**



## Earnings

*Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic* receive median hourly earnings of \$31.56; this is more than the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 3).<sup>5</sup>

**Exhibit 3: Hourly Earnings<sup>6</sup> for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic in San Diego County<sup>7</sup>**



<sup>4</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2018.

<sup>5</sup> "California Family Needs Calculator." Insight Center for Community Economic Development, last updated 2018. [insightccd.org/2018-family-needs-calculator](https://insightccd.org/2018-family-needs-calculator).

<sup>6</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>7</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

## Educational Supply

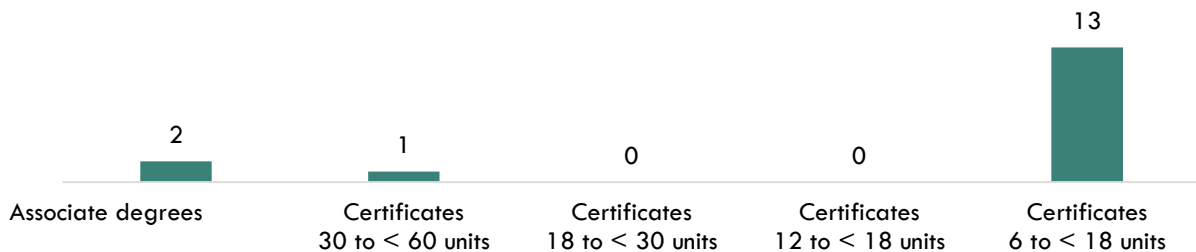
Educational supply for an occupation can be estimated by analyzing the number of awards conferred by a course or program in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.<sup>8</sup> According to TOP and CIP<sup>9</sup> data, **one** community college supplies the region with for-credit awards for Manufacturing and Industrial Technology (TOP 095600): [San Diego City College](#) (Exhibit 4a).

**Exhibit 4a: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Years 2015-16 through 2017-18)**

College	Award Type	PY 15-16	PY 16-17	PY 17-18	3-Year Avg
San Diego City	Associate of Science (A.S.) degree	0	1	4	2
	Certificate 30 to < 60 units	1	0	2	1
	Certificate 6 to < 18 units	12	5	23	13
Total		<b>13</b>	<b>6</b>	<b>29</b>	<b>16</b>

While San Diego City College offers associate degrees for Manufacturing and Industrial Technology (TOP 095600), certificates with 6 to < 18 units have the greatest number of awards in the past three program years with 13 awards (Exhibit 4b).

**Exhibit 4b: Total Number of Awards by Type for Manufacturing and Industrial Technology TOP 095600 in San Diego County (Three-Year Average 2015-16 through 2017-18)**



<sup>8</sup> TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart ([datamart.cccco.edu](http://datamart.cccco.edu)) and CIP data comes from the Integrated Postsecondary Education Data System ([nces.ed.gov/ipeds/use-the-data](http://nces.ed.gov/ipeds/use-the-data))

<sup>9</sup> There are seven CIP codes related to Manufacturing and Industrial Technology (TOP 095600): Robotics Technology/Technician (CIP 150405), Automation Engineer Technology/Technician (CIP 150406), Metallurgical Technology/Technician (CIP 150611), Manufacturing Engineering Technology/Technician (CIP 150613), Automotive Engineering Technology/Technician (CIP 150803), Mechanical Engineering/Mechanical Technology/Technician (CIP 150805), and Industrial and Product Design (CIP 500404).

In terms of noncredit awards, only San Diego Continuing Education provides noncredit awards for Manufacturing and Industrial Technology (TOP 095600), with an average of zero noncredit awards between program years 2015-16 and 2017-18 (Exhibit 5).

**Exhibit 5: Number of Noncredit Awards (Certificates and Degrees) Conferred by SDCE (Program Years 2015-16 through 2017-18)**

Program Title	Award Type	PY 15-16	PY 16-17	PY 17-18	3-Year Avg
Pipe Welding/Pipefitting	Program Award	0	1	0	0

## Demand vs. Supply

In short, the region supplies 16 for-credit and noncredit awards for 28 annual job openings, suggesting that there is a small labor market supply gap (Exhibit 6).

**Exhibit 6: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)**

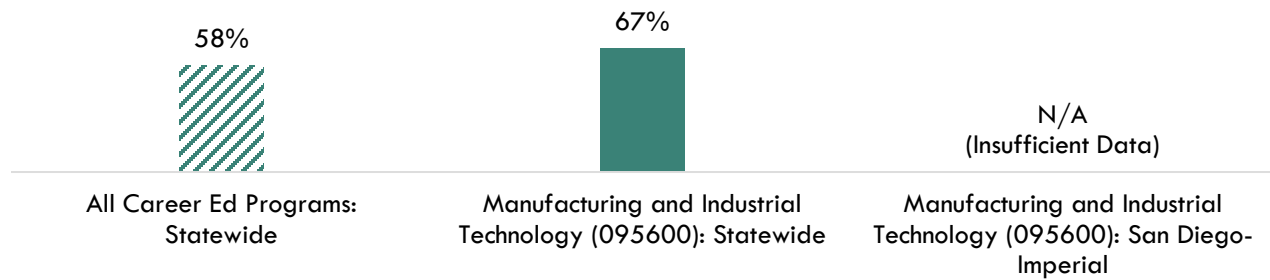
TOP6 Program	Demand (Annual Openings)	Supply (Total Annual Average Supply)		Supply Gap or Oversupply
		Noncredit	For-Credit	
Manufacturing and Industrial Technology (TOP 095600)	28	0	16	12

**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.

## Student Outcomes and Regional Comparisons

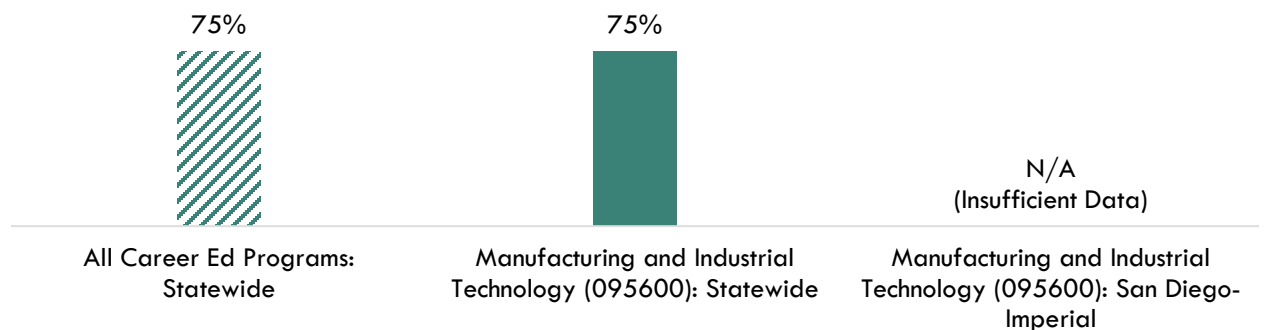
According to the California Community Colleges LaunchBoard, **N/A** percent of students (due to insufficient data) in the San Diego-Imperial region earned a living wage after completing a Manufacturing and Industrial Technology (095600) program, compared to **67** percent statewide and 58 percent of students in Career Education programs in general across the state (Exhibit 7a).

**Exhibit 7a: Proportion of Students Who Earned a Living Wage, PY2015-16<sup>10</sup>**



According to the California Community Colleges LaunchBoard, **N/A** percent of students (due to insufficient data) in the San Diego-Imperial region obtained a job closely related to their field of study after completing a Manufacturing and Industrial Technology (095600) program, compared to **75** percent statewide and 75 percent of students in Career Education programs in general across the state (Exhibit 7b).

**Exhibit 7b: Percentage of Students in a Job Closely Related to Field of Study, PY2014-15<sup>11</sup>**



<sup>10</sup> Among completers and skills builders who exited, the proportion of students who attained a living wage.

<sup>11</sup> Most recent year with available data is Program Year 2014-15. 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.

## Top Employers and Work Locations

Between January 1, 2016 and December 31, 2018, the top five employers in San Diego County for this occupation were [General Atomics](#), [GKN](#), [Epsilon Systems Solutions Incorporated](#), [TE Connectivity](#), and [Synergy Top](#) (Exhibit 8).

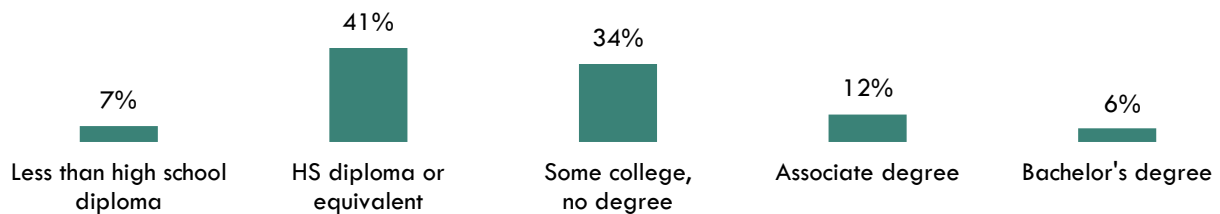
**Exhibit 8: Top Employers in San Diego County for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic<sup>12</sup>**

Top Employers	
<ul style="list-style-type: none"> <li>• General Atomics</li> <li>• GKN</li> <li>• Epsilon Systems Solutions Incorporated</li> <li>• TE Connectivity</li> <li>• Synergy Top</li> </ul>	<ul style="list-style-type: none"> <li>• Nuvasive Incorporated</li> <li>• LMI Aerospace Incorporated</li> <li>• Johnson Matthey Incorporated</li> <li>• Vantage Associated Incorporated</li> <li>• Triumph Group Incorporated</li> </ul>

## Skills, Education, and Certifications

The typical on-the-job training for this profession is [moderate-term on-the-job training](#). Nationally, employers report that typical entry-level education is [postsecondary nondegree award](#). However, the educational attainment for the occupation typically found currently in the national labor force is a high school diploma or equivalent (Exhibit 9a).<sup>13</sup>

**Exhibit 9a: National Educational Attainment for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic<sup>14</sup>**



<sup>12</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.

<sup>13</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

<sup>14</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

Based on online job postings between January 1, 2016 and December 31, 2018, the top listed educational requirement for *Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic* in San Diego County was a [high school diploma or vocational training](#) (Exhibit 9b).<sup>15</sup>

**Exhibit 9b: Educational Requirements for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic in San Diego County in Online Job Postings<sup>16</sup>**

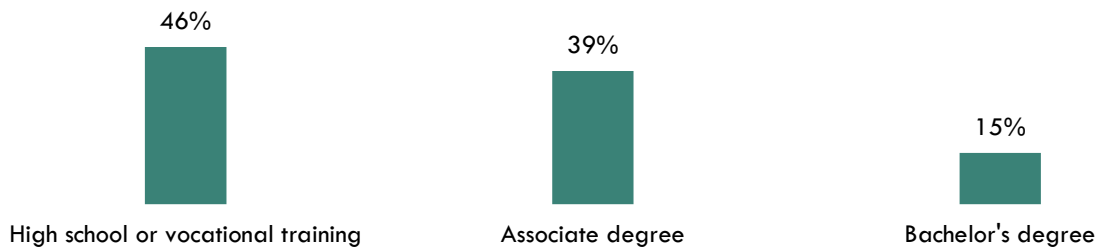


Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2016 and December 31, 2018.

**Exhibit 10: Top Skills for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic in San Diego County<sup>17</sup>**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> <li>• Computer Numerical Control</li> <li>• Machining</li> <li>• Lathes</li> <li>• Mastercam</li> <li>• Engineering Drawings</li> </ul>	<ul style="list-style-type: none"> <li>• Communication Skills</li> <li>• Computer Literacy</li> <li>• Written Communication</li> <li>• Troubleshooting</li> <li>• Editing</li> </ul>	<ul style="list-style-type: none"> <li>• SolidWorks</li> <li>• Computer Aided Manufacturing</li> <li>• CATIA</li> <li>• Unigraphics</li> <li>• Computer Aided Drafting/Design</li> </ul>

<sup>15</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.

<sup>16</sup> "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified October 18, 2018. [bls.gov/emp/tables/educational-attainment.htm](https://bls.gov/emp/tables/educational-attainment.htm).

<sup>17</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.



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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.