

Program Endorsement Brief:

Advanced Manufacturing in the Greater Sacramento region

North Far North Center of Excellence, November 2019

INTRODUCTION

This report provides an overview of the labor market demand and educational program supply for advanced manufacturing related occupations in the Greater Sacramento region and the broader 22-county North Far North region. Please note that the Center of Excellence TOP-CIP-SOC crosswalk maps to an additional 11 occupations for the broader advanced manufacturing TOP code included in this report. For the purpose of brevity, those 11 occupations were not included.

SUMMARY OF KEY FINDINGS

- Advanced manufacturing jobs declined by 1% percent in the Greater Sacramento region and 7.5% in the North/Far North region in the past ten years. The Greater Sacramento region is projected to add another 130 jobs over the next five years.
- Wages are above living wage threshold for a one adult household in the Greater Sacramento region. Wages range from \$17 per hour to \$37 per hour for the occupations studied.
- Job posting volume for related occupations is inconsistent. There were 263 job postings for related occupations in the last 12 months.
- A majority of incumbent workers in the related occupations have a high school diploma education level.
- The community colleges conferred 21 awards on average annually over the last three years.

The report contains the following sections:

- Occupational demand,
- Wages and job postings,
- Educational attainment and supply, and
- Findings and recommendations.

OCCUPATIONAL DEMAND

The following Standard Occupational Classification (SOC) codes related to the proposed program were included in the analysis:

51-4011.00 - Computer-Controlled Machine Tool Operators, Metal and Plastic	
Description:	Operate computer-controlled machines or robots to perform one or more machine functions on metal or plastic work pieces.
Sample job titles:	Brake Press Operator, Computer Numerical Control Lathe Operator (CNC Lathe Operator), Computer Numerical Control Machine Operator (CNC Machine Operator), Computer Numerical Control Machinist (CNC Machinist), Computer Numerical Control Mill Operator (CNC Mill Operator), Computer Numerical Control Operator (CNC Operator), Computer Numerical Control Set-Up and Operator (CNC Set-Up and Operator), Machine Operator, Machine Set-Up Operator, Machinist
51-4012.00 - Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	
Description:	Develop programs to control machining or processing of metal or plastic parts by automatic machine tools, equipment, or systems.
Sample job titles:	CAD CAM Programmer (Computer-Aided Design Computer-Aided Manufacturing Programmer), Computer Numerical Control Machine Operator (CNC Machine Operator), Computer Numerical Control Machining Center Operator (CNC Machining Center Operator), Computer Numerical Control Machinist (CNC Machinist), Computer Numerical Control Operator (CNC Operator), Computer Numerical Control Programmer (CNC Programmer), Machine Shop Lead Man, Machining Manager, Process Engineer, Programmer
51-4031.00 - Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	
Description:	Set up, operate, or tend machines to saw, cut, shear, slit, punch, crimp, notch, bend, or straighten metal or plastic material.
Sample job titles:	Die Setter, Fabrication Operator, Machine Operator, Machine Setter, Operator, Press Operator, Punch Press Operator, Saw Operator, Set-Up Operator, Slitter Operator
51-4032.00 - Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	
Description:	Set up, operate, or tend drilling machines to drill, bore, ream, mill, or countersink metal or plastic work pieces.
Sample job titles:	Bore Mill Operator, Computer Numerical Control Drilling Operator (CNC Drilling Operator), Drill Operator, Drill Press Operator, Drill Setup Operator, Driller, Machine Operator, Machinist, Punch Operator, Radial Drill Operator
51-4041.00 - Machinists	
Description:	Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, mathematics, metal properties, layout, and machining procedures.
Sample job titles:	Gear Machinist, Journeyman Machinist, Machine Operator, Machine Repair Person, Machinist, Maintenance Machinist, Maintenance Specialist, Production Machinist, Set-Up Machinist, Tool Room Machinist
51-4081.00 - Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	
Description:	Set up, operate, or tend more than one type of cutting or forming machine tool or robot.
Sample job titles:	Cell Technician, CNC Machine Setter (Computer Numerically Controlled Machine Setter), CNC Machinist (Computer Numerically Controlled Machinist), CNC Operator (Computer Numerically Controlled Operator), Die Setter, Machine Operator, Machine Technician, Machinist, Operator, Set-Up Person

Exhibit 1 summarizes the job trends by SOC codes in the 7-county Greater Sacramento region, the 22-county North Far North region, and California.

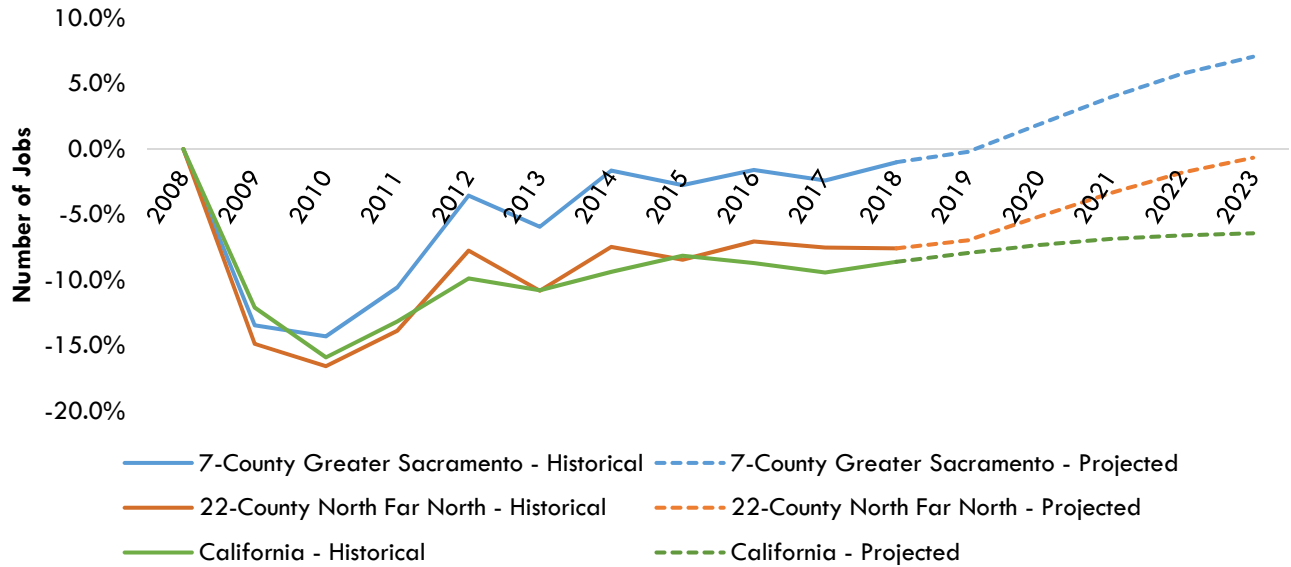
Exhibit 1. Employment and projected occupational demand¹

Occupation	SOC	2008 Jobs	2018 Jobs	2023 Jobs	2018-23 % Change	Annual Openings
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	51-4012	25	48	57	17.6%	7
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4032	93	40	36	-8.9%	7
Machinists	51-4041	1,133	1,027	1,098	6.9%	130
Metal-Refining Furnace Operators and Tenders	51-4051	12	<10	<10	0%	1
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4081	193	339	365	7.8%	43
Cutting and Slicing Machine Setters, Operators, and Tenders	51-9032	149	135	162	20.1%	25
GREATER SACRAMENTO	TOTALS	1,605	1,589	1,718	8.1%	212
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	51-4012	27	51	62	20.5%	8
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4032	209	93	88	-5.1%	15
Machinists	51-4041	1,488	1,295	1,386	7.0%	169
Metal-Refining Furnace Operators and Tenders	51-4051	13	<10	<10	0%	2
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4081	241	424	457	7.8%	54
Cutting and Slicing Machine Setters, Operators, and Tenders	51-9032	280	224	250	11.8%	40
NORTH FAR NORTH	TOTALS	2,258	2,087	2,243	7.5%	288
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	51-4012	1,639	2,598	2,811	8.2%	338
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4032	4,224	1,682	1,532	-8.9%	259
Machinists	51-4041	40,331	37,602	38,465	2.3%	4,221
Metal-Refining Furnace Operators and Tenders	51-4051	665	476	502	5.4%	76
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4081	4,096	5,537	5,847	5.6%	679
Cutting and Slicing Machine Setters, Operators, and Tenders	51-9032	7,252	5,305	5,312	0.1%	754
CALIFORNIA	TOTALS	58,207	53,200	54,468	2.4%	6,327

¹ Emsi 2019.2; QCEW Employees, Non-QCEW Employees and Self-Employed. The 7-county Greater Sacramento region includes El Dorado, Placer, Nevada, Sacramento, Sutter, Yolo and Yuba. The 22-county North Far North region includes the aforementioned counties as well as Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama and Trinity.

Exhibit 2 compares the rates of change of the total number of jobs between 2008 and 2018 in the Greater Sacramento region, the North Far North region, and California. It also compares occupational demand projections from 2018 through 2023 across the same areas. The rate of change is indexed to the base year 2008 total number of jobs.

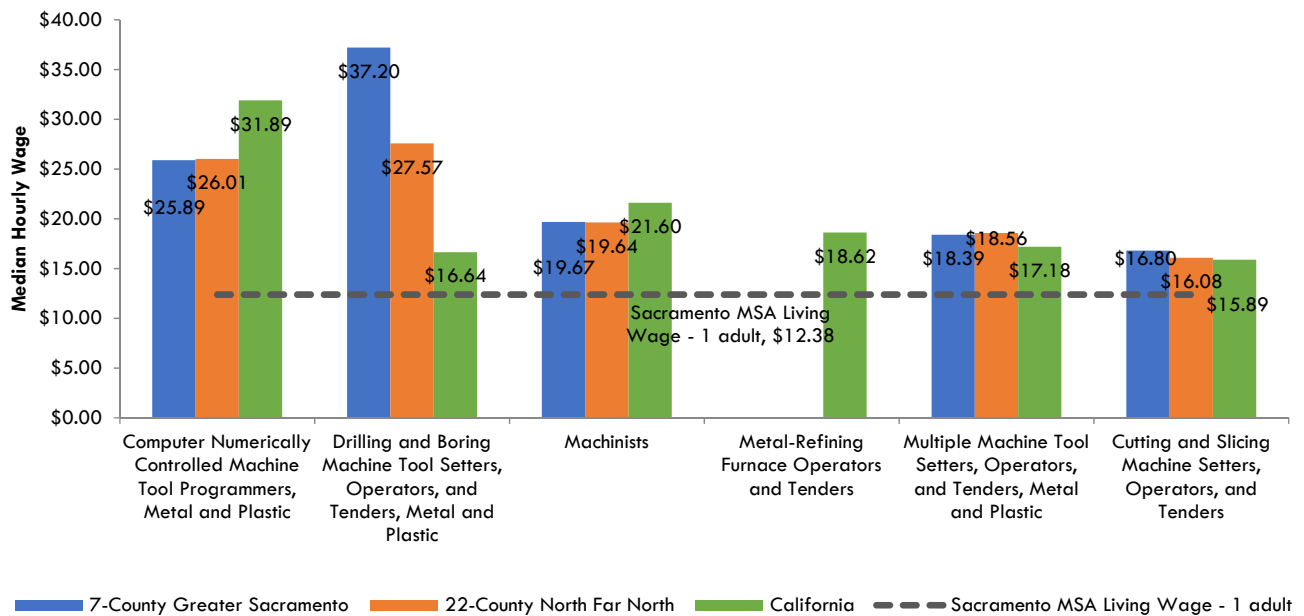
Exhibit 2. Rate of Change for Selected Occupations²



WAGES AND JOB POSTINGS

Exhibit 3 compares the median hourly wages of the selected occupations in the study regions to the Sacramento Metropolitan Statistical Area (MSA) living wage for a one-adult household.³

Exhibit 3. Wages for selected occupations⁴



² Ibid.

³ Living Wage Calculator: Counties and Metropolitan Statistical Areas in California, <http://livingwage.mit.edu/>

⁴ Emsi 2019.2; QCEW Employees, Non-QCEW Employees and Self-Employed.

Burning Glass identified a pool of 263 job postings in the Greater Sacramento region for the selected occupations. This data represents job listings posted online within the last year, from November 1, 2018, through October 31, 2019.

Exhibit 4 compares the 12-month job posting trends of the selected occupations to the median number of job postings in the Greater Sacramento region.

Exhibit 4. Job postings trend for selected occupations⁵

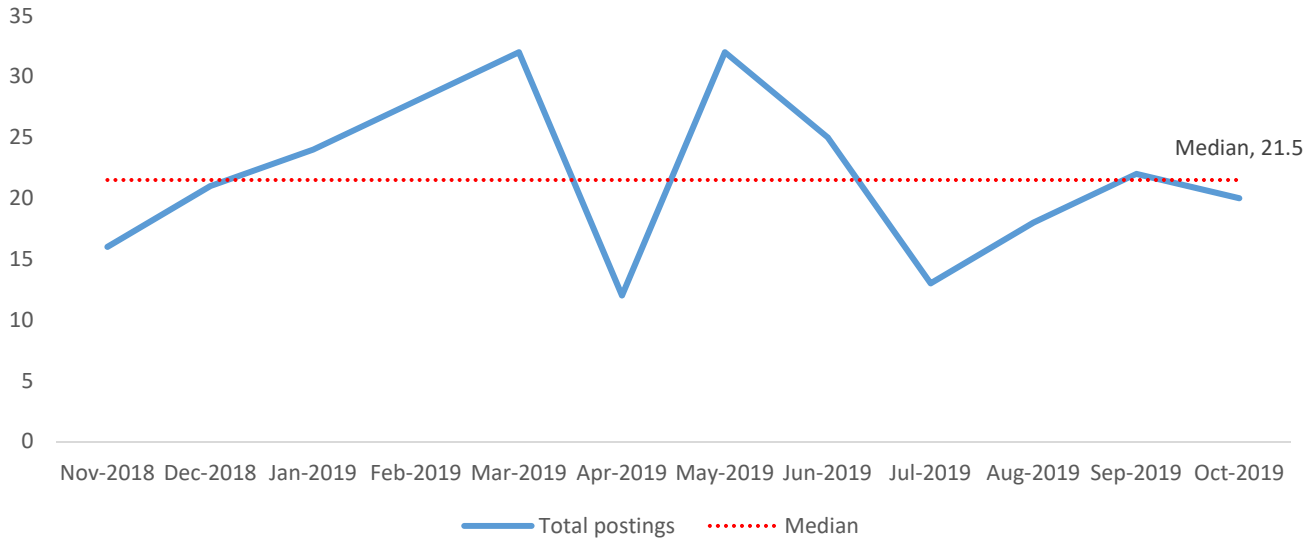
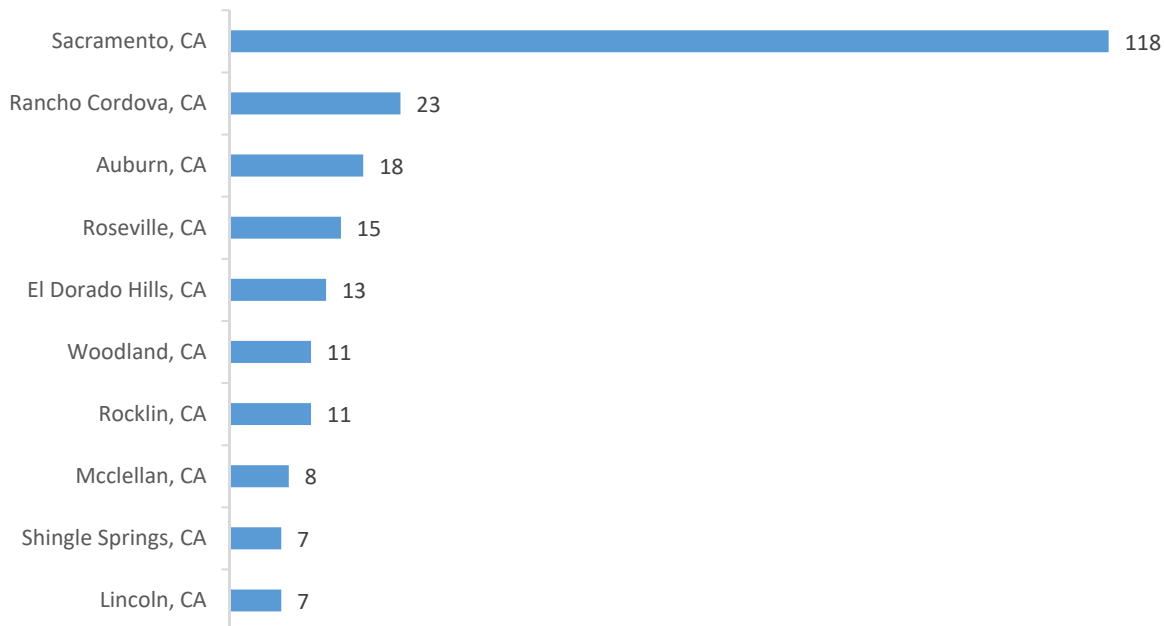


Exhibit 5 shows the number of job postings by city for the selected occupations.

Exhibit 5. Top job postings locations for selected occupations⁶



⁵ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool," <http://www.burning-glass.com>, 2019.

⁶ Ibid.

Exhibit 6 lists the employers with the most job openings for the selected occupations within the study region. More than 30% of job postings were excluded because they did not include an employer name. As a result, the table below may not be representative of the full sample.

Exhibit 6. Top employers by number of job postings⁷

Employer	Greater Sacramento (n = 168)	
	Number of Postings	Percent of Postings
Svs Group Incorporated	16	17%
Martin Sprocket Gear Incorporated	7	7%
Kratos Defense & Security Solutions	7	7%
Tri Tool Incorporated	6	6%
Snowline Engineering	5	5%
AtWork	5	5%
TechnipFMC	4	4%
El Dorado Molds Incorporated	4	4%
Amteltek, Inc	4	4%
State of California	3	3%

Exhibit 7 shows the top job titles for advanced manufacturing in the Greater Sacramento region. All 263 job postings included job titles.

Exhibit 7. Top job titles by number of job postings⁸

Job Title	Greater Sacramento (n = 263)	
	Number of Postings	Percent of Postings
CNC Machinist	71	27%
Machinist	43	16%
CNC Operator	35	13%
Machine Operator	21	8%
CNC Machine Operator	20	8%
CNC Programmer	16	6%
Drilling Operator	5	2%
Manual Machinist	4	2%
Journeyman Machinist	4	2%
Technician	3	1%

⁷ Ibid.

⁸ Ibid.

Exhibit 8 shows the skills most in-demand for the selected occupations in the Greater Sacramento region. 250 of the 263 job postings included at least three skills in the job posting.

Exhibit 8. Top skills by number of job postings ⁹

Specialized Skills in Greatest Demand		
Title	Job Postings	% Job Posting
Computer Numerical Control (CNC)	195	78%
Machining	171	68%
Lathes	90	36%
Computerized Numerical Control Lathes	55	22%
Machine Operation	53	21%
Machinery	51	20%
Repair	51	20%
Micrometers	48	19%
Calipers	41	16%
Grinders	41	16%
Baseline Skills in Greatest Demand		
Title	Job Postings	% Job Posting
Work Area Maintenance	50	20%
Organizational Skills	44	18%
Detail-Oriented	40	16%
Communication Skills	39	16%
Physical Abilities	39	16%
Editing	34	14%
Problem Solving	30	12%
Teamwork / Collaboration	30	12%
English	29	12%
Preventive Maintenance	26	10%
Software Skills in Greatest Demand		
Title	Job Postings	% Job Posting
Microsoft Excel	11	4%
Computer Aided Manufacturing (CAM)	10	4%
Microsoft Office	10	4%
Microsoft Word	10	4%
SolidWorks	7	3%
Computer Aided Drafting/Design (CAD)	6	2%
Surfcam	6	2%
Autodesk	5	2%
Enterprise Resource Planning (ERP)	2	1%
Lotus Applications	2	1%

⁹ Ibid.

EDUCATION AND TRAINING

Exhibit 9 shows the average level of educational attainment for workers 25 years and older by occupation across the U.S.

Exhibit 9. Typical educational attainment for selected occupations, nationally¹⁰

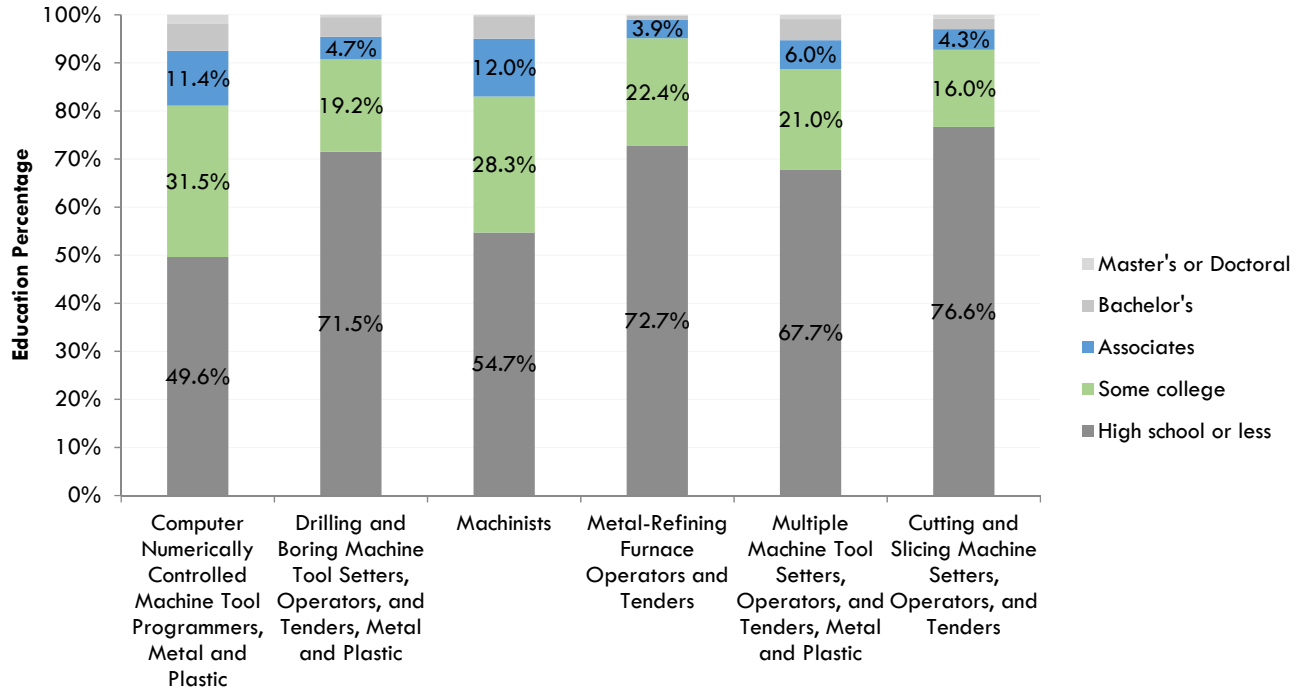


Exhibit 10 shows the typical entry-level education requirements, on-the-job training, and work experience requirements for the selected occupations in the Greater Sacramento region.

Exhibit 10. Typical education, training, and work experience for selected occupations¹¹

Occupations	SOC	Typical Entry-Level Education	Typical On-The-Job Training	Work Experience Required
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	51-4012	Postsecondary nondegree award	Moderate-term on-the-job training	None
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4032	High school diploma or equivalent	Moderate-term on-the-job training	None
Machinists	51-4041	High school diploma or equivalent	Long-term on-the-job training	None
Metal-Refining Furnace Operators and Tenders	51-4051	High school diploma or equivalent	Moderate-term on-the-job training	None
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4081	High school diploma or equivalent	Moderate-term on-the-job training	None
Cutting and Slicing Machine Setters, Operators, and Tenders	51-9032	High school diploma or equivalent	Moderate-term on-the-job training	None

¹⁰ Bureau of Labor Statistics. Educational Attainment for Workers 25 Years and Older by Detailed Occupation, 2016-2017, <https://www.bls.gov/emp/tables/educational-attainment.htm>.

¹¹ Emsi 2019.2; QCEW Employees, Non-QCEW Employees and Self-Employed.

PROGRAM SUPPLY

Analysis of existing educational programs shows that there is one Taxonomy of Program (TOP) code related to training for advanced manufacturing occupations: 0956.00 – Manufacturing and Industrial Technology. The corresponding Classification of Instructional Programs (CIP) code for this program is 15.0613 – Manufacturing Engineering Technology/Technician.

Exhibit 11 compares the total number of awards (certificates and degrees) conferred by colleges in the selected TOP and CIP codes in the Greater Sacramento region over the last three academic years.

Exhibit 11. Total awards conferred by Greater Sacramento post-secondary institutions, 2016-19¹²

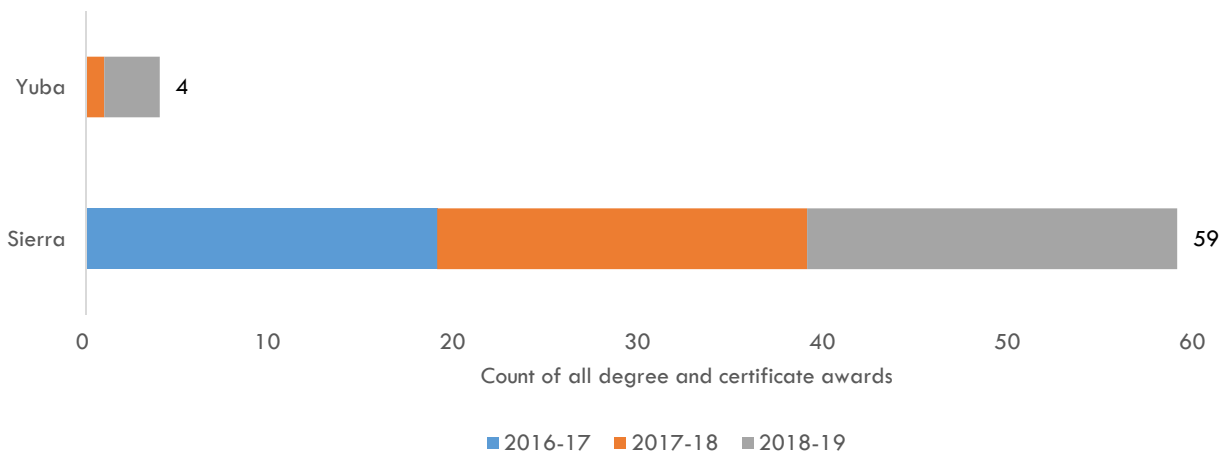


Exhibit 12 displays program awards by level and year for the selected education programs over the last three academic years.

Exhibit 12. Program awards conferred by Greater Sacramento community colleges, 2015-2018¹³

0956.00 – MANUFACTURING AND INDUSTRIAL TECHNOLOGY	CERTIFICATE				ASSOCIATE			
	2016-17	2017-18	2018-19	AVG	2016-17	2017-18	2018-19	AVG
SIERRA	7	6	2	5	12	14	18	15
YUBA	0	1	2	1	0	0	1	0
TOTALS	7	7	4	6	12	14	19	15

¹² COE Supply Tables, California Community Colleges Chancellor's Office DataMart, and Integrated Postsecondary Education Data System (IPEDS).

¹³ Ibid.

FINDINGS

- Between 2008 and 2018, advanced manufacturing occupations lost 16 jobs in the Greater Sacramento region. Jobs for advanced manufacturing occupations are projected to increase over the next five years, adding 130 new jobs - a projected growth rate of 8.1%.
- The selected advanced manufacturing occupations are projected to have just over 200 annual openings per year over the next five years.
- Jobs in the selected advanced manufacturing occupations in the Greater Sacramento region is projected to grow at a faster rate than that of the North/Far North region (7%) and the State (2%).
- Median hourly wages for the selected occupations are above the regional living wage for a single adult household. Hourly wages in the Greater Sacramento region range from \$17 to \$37 per hour.
- Between 50% and 77% of incumbent workers in the selected occupations hold a high school diploma or less. The typical entry-level education most of the selected occupations is a high school diploma. Only CNC machine tool programmers are required to have a postsecondary nondegree award.
- There are two community colleges in the region that offer awards in 0956.00 – Manufacturing and Industrial Technology – Sierra College and Yuba College. These two colleges conferred a total of 63 certificates and degrees between 2016 and 2019.
- Sierra College conferred the largest share of awards between 2016 and 2019. Sierra conferred an average of 5 certificates and 15 associate degrees over the last three academic years.

RECOMMENDATIONS

- Based on a three-year average of annual award in advanced manufacturing in the Greater Sacramento region (21 certificates and degrees), and projected yearly openings for related occupations (212 openings), the region appears to have some demand for programs related to the occupation.

COE Recommendation		
Move forward with program	Program is not recommended	Additional information needed
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

METHODOLOGY

Occupations in this report were identified using O*Net. Findings in this report were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

APPENDIX A: DATA SOURCES

Sources used for data analysis purposes in this report include:

- U.S. Department of Labor/Employment and Training Administration (DOLETA) O*NET Online
- Burning Glass, Labor Insight/Jobs
- Economic Modeling Specialists, International (EMSI)
- California Employment Development Department, Labor Market Information Division (EDD, LMID)
- Bureau of Labor Statistics, Occupational Employment Statistics (OES)
- California Community Colleges Chancellor's Office, Cal-PASS Plus LaunchBoard
- Living Insight Center for Community Economic Development, Self-Sufficiency Standard Tool for California
- California Community Colleges Chancellor's Office Management Information Systems (MIS Data Mart)
- U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)

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