



Tooling & Milling (Machining and Machine Tools TOP 0956.30)

August 2022

Prepared by the South Central Coast Center of Excellence for
Labor Market Research

Program Recommendation

This report was compiled by the South Central Coast¹ Center of Excellence to provide regional labor market data for the program recommendation – Machining and Machine Tools. This report can help determine whether there is demand in the local labor market that is not being met by the supply from programs of study (CCC and non-CCC) that align with this occupation group.

Key Findings

- In the South Central Coast region, **the number of jobs related to Machining and Machine Tools are expected to increase** for Maintenance and Repair Workers, General and Helpers - Production Workers. The number of related jobs are expected to **remain steady** for Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic; Machinists; and Computer Numerically controlled Tool Operators and to **decrease** for Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic.
- Machining and Machine Tools is anticipated to experience a **low risk of automation** for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic and a **high risk of automation** for Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic. The remaining occupations have a **medium risk of automation**.
- In 2020 there were 317 regional completions in programs related to the occupations identified as related to Machining and Machine Tools and 1,644 openings, indicating an **undersupply**.
- Typical entry-level education for all six related occupations is a **high school diploma or equivalent**.
- Completers of Machining and Machine Tools programs from the 2018-2019 academic year in the South Central Coast region had a **median annual wage upon completion of \$43,778**.
- 55% of students are **employed within a year** after completing a program.
- 58% of students **attained a living wage** within a year of completion.
- Completers experienced an average of **+37%** change in earnings after exiting.
- 84% of students were **part-time**, 22% **skill builders**, 40% **first-generation**, and 73% **economically disadvantaged**.

¹ The South Central Coast Region consists of San Luis Obispo County, Santa Barbara County, Ventura County, and the following cities from North Los Angeles County: Canyon Country, Castaic, Lake Hughes, Lancaster, Littlerock, Llano, Newhall, Palmdale, Pearblossom, Santa Clarita, Stevenson Ranch, and Valencia.

Occupation Codes and Descriptions

There are six occupations in the standard occupational classification (SOC) system that were identified as related to Machining and Machine Tools for this analysis. The occupation titles and descriptions, as well as reported job titles, are included in Exhibit 1.

Exhibit 1 – Occupation, description, and sample job titles

SOC Code	Title	Description	Sample of Reported Job Titles
49-9071	Maintenance and Repair Workers, General	Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of a building in repair. Duties may involve pipe fitting; HVAC maintenance; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.	Building Mechanic, Equipment Engineering Technician, Facilities Technician, Maintenance Engineer, Maintenance Journeyman, Maintenance Man, Maintenance Mechanic, Maintenance Specialist, Maintenance Technician, Maintenance Worker
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend lathe and turning machines to turn, bore, thread, form, or face metal or plastic materials, such as wire, rod, or bar stock.	Computer Numerical Control Lathe Operator (CNC Lathe Operator), Lathe Operator, Lathe Set Up Person, Machine Operator, Numerical Control Operator (NC Operator), Screw Machine Operator, Screw Machine Tool Setter, Setup Operator, Turn Operator
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend milling or planing machines to mill, plane, shape, groove, or profile metal or plastic work pieces.	Machine Operator, Mill Operator, Miller, Milling Operator
51-4041	Machinists	Set up and operate a variety of machine tools to produce precision parts and instruments out of metal. 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.	Computer Numerically Controlled Machinists (CNC Machinists), CNC Machinist, Gear Machinist, Machine Repair Person, Machinist, Maintenance Machinist, Manual Lathe Machinist, Production Machinist, Tool Room Machinist

SOC Code	Title	Description	Sample of Reported Job Titles
51-9161	Computer Numerically Controlled Tool Operators	Operate computer-controlled tools, machines, or robots to machine or process parts, tools, or other work pieces made of metal, plastic, wood, stone, or other materials. May also set up and maintain equipment.	Brake Press Operator, Computer Numerically Controlled Lathe Operator (CNC Lathe Operator), CNC Machine Operator, CNC Machinist, CNC Mill Operator, CNC Operator, CNC Set-Up and Operator, Machine Operator, Machine Set-Up Operator, Machinists
51-9198	Helpers – Production Workers	Help production workers by performing duties requiring less skill. Duties include supplying or holding materials or tools, and cleaning work area and equipment.	Helper, Material Handler, Press Helper

Source: O*NET Online

Current and Future Employment

In the South Central Coast region, the number of jobs related to Machining and Machine Tools are expected to increase for Maintenance and Repair Workers, General and Helpers - Production Workers. The number of related jobs are expected to remain steady for Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic; Machinists; and Computer Numerically controlled Tool Operators. The number of related jobs are expected to decrease for Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic.

Exhibit 2 – Five-year projections for Machining and Machine Tools in the South Central Coast region

SOC	Occupation	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change
49-9071	Maintenance and Repair Workers, General	7,816	8,249	6%	433
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	134	128	-4%	-6
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	130	121	-7%	9
51-4041	Machinists	1,853	1,934	4%	81
51-9161	Computer Numerically Controlled Tool Operators	861	850	-1%	11
51-9198	Helpers – Production Workers	908	954	5%	46

Source: Economic Modeling Specialists International (EMSI)

Earnings

Exhibit 3 contains hourly wages and annual average earnings for these occupations. Entry-level hourly earnings are represented by the 25th percentile of wages, median hourly earnings are represented by the 50th percentile of wages, and experienced hourly earnings are represented by the 75th percentile of wages, demonstrating various levels of employment.

Exhibit 3 – Earnings for Machining and Machine Tools in the South Central Coast region

SOC	Occupation	Entry-Level Hourly Earnings	Median Hourly Earnings	Experienced Hourly Earnings
49-9071	Maintenance and Repair Workers, General	\$17.61	\$22.32	\$28.49
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	\$17.59	\$22.56	\$24.78
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	\$18.86	\$23.57	\$28.13
51-4041	Machinists	\$18.08	\$22.79	\$28.69
51-9161	Computer Numerically Controlled Tool Operators	\$17.96	\$22.50	\$27.05
51-9198	Helpers – Production Workers	\$14.34	\$14.99	\$18.18

Source: Economic Modeling Specialists International (EMSI)

Exhibit 3b: Earnings for Machining and Machine Tools in the South Central Coast Region



Source: Family Needs Calculator (Living wage is based on Single Adult household with no children); Economic Modeling Specialists International (EMSI)

Employer Job Postings

In this research brief, real-time labor market information is used to provide a more nuanced view of the current job market, as it captures job advertisements for occupations relevant to the field of study. Employer job postings are consulted to understand who is looking for machinists, and what they are looking for in potential candidates. To identify job postings related to Machining and Machine Tools the following standard occupational classifications were used:

49-9071	Maintenance and Repair Workers, General
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
51-4041	Machinists
51-9198	Helpers – Production Workers

Top Occupations

In 2021, there were 3,855 employer postings for the occupations related to Machining and Machine Tools.

Exhibit 4 – Top occupations in job postings and risk of automation tables

SOC Code	Occupation	Job Postings, Full Year 2021
49-9071	Maintenance and Repair Workers, General	3,127
51-4041	Machinists	342
51-9198	Helpers – Production Workers	273
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	106
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	5
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2

Source: Labor Insight/Jobs (Burning Glass)

SOC Code	Occupation	Risk of Automation
49-9071	Maintenance and Repair Workers, General	Medium
51-4041	Machinists	Medium
51-9198	Helpers – Production Workers	Medium
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	Low
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	High
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Medium

Source: Labor Insight/Jobs (Burning Glass)

Top Titles

The top job titles for employers posting ads for jobs related to Machining and Machine Tools are listed in Exhibit 5. Maintenance Technician is mentioned as the job title in 10% of all relevant job postings (388 postings).

Exhibit 5 –Job Titles

Title	Job Postings, Full Year 2021
Maintenance Technician	388
Service Technician	145
Maintenance	105
Field Service Technician	86
Service and Repair Technician	81

Source: Labor Insight/Jobs (Burning Glass)

Top Employers

Exhibit 6 lists the major employers hiring professionals in the Machining and Machine Tools field. The top employer posting job ads was McDonald's. The top worksite cities in the region for these occupations were Santa Clarita, Oxnard, Ventura, Santa Barbara, and Thousand Oaks.

Exhibit 6 – Top Employers (n=2,235)

Employer	Job Postings, Full Year 2021
McDonald's	57
Avantor	57
Northrop Grumman	51
Gold's Gym	49
Assurant	33

Source: Labor Insight/Jobs (Burning Glass)

Skills

The tables in Exhibit 7 list employers' most commonly requested skills in job postings related to Machining and Machine Tools. Repair is the most sought-after specialized skill for employers, followed by Plumbing and Painting. Physical Abilities, Troubleshooting, and Preventative Maintenance were the most requested baseline skills. Microsoft Office, Microsoft Excel, and Microsoft Word were the most commonly requested software and programming skills.

Exhibit 7 –Specialized Skills (n= 27,412)

Skills	Job Postings, Full Year 2021
Repair	2,206
Plumbing	1,282
Painting	892
HVAC	843
Cleaning	735
Carpentry	670
Customer Service	664
Predictive/Preventative Maintenance	602
Machinery	507
Hand Tools	449
Machining	442
Scheduling	428
Computer Numerical Control (CNC)	416
Power Tools	345
Drywall	306

Source: Labor Insight/Jobs (Burning Glass)

Baseline Skills (n= 11,601)

Skills	Job Postings, Full Year 2021
Physical Abilities	944
Troubleshooting	894
Preventative Maintenance	890
Communication Skills	863
Detail-Oriented	657
Problem Solving	573
Organizational Skills	534
Teamwork/Collaboration	475
English	417
Computer Literacy	405

Source: Labor Insight/Jobs (Burning Glass)

Software and Programming Skills (n= 2,434)

Skills	Job Postings, Full Year 2021
Microsoft Office	359
Microsoft Excel	354
Microsoft Word	204
Enterprise Resource Planning (ERP)	101
Customer Relationship Management (CRM)	99
AutoCAD	94
Microsoft Visio	91
Microsoft Powerpoint	84
Software Maintenance	83
Design Software	81

Source: Labor Insight/Jobs (Burning Glass)

The table below lists the skill clusters most in demand for Machining and Machine Tools occupations.

Skill Clusters in Demand (n= 21,716)

Skill Cluster	Job Postings, Full Year 2021
Maintenance, Repair, and Installation: Plumbing	1,324
Maintenance, Repair, and Installation: Equipment Repair and Maintenance	1,136
Maintenance, Repair, and Installation: HVAC	897
Maintenance, Repair, and Installation: Painting	892
Customer and Client Support: Basic Customer Service	889
Architecture and Construction: Carpentry	787
Manufacturing and Production: Machine Tools	606
Human Resources: Occupational Health and Safety	591
Maintenance, Repair, and Installation: Hand Tools	562
Manufacturing and Production: Machinery	554

Source: Labor Insight/Jobs (Burning Glass)

Industry Concentration

Exhibit 8 shows the industries with the most Machining and Machine Tools postings in the South Central Coast. Note: 31% of records have been excluded because they do not include an industry. As a result, the chart below may not be representative of the full sample.

Exhibit 8 – Industries employing the most in the Machining and Machine Tools field, 2021

Industry	Occupation Group Jobs in Industry	% of Occupation Group in Industry
Manufacturing	632	23.8%
Accommodation and Food Services	366	13.8%
Real Estate and Rental and Leasing	333	12.5%
Administrative and Support and Waste Management and Remediation Services	202	7.6%
Construction	202	5.2%

Source: Labor Insight/Jobs (Burning Glass)

Certifications

Exhibit 9 lists the most in-demand certifications in the Machining and Machine Tools field. The top requested certification in job postings was Driver’s License.

Exhibit 9: Certifications (n= 1,869)

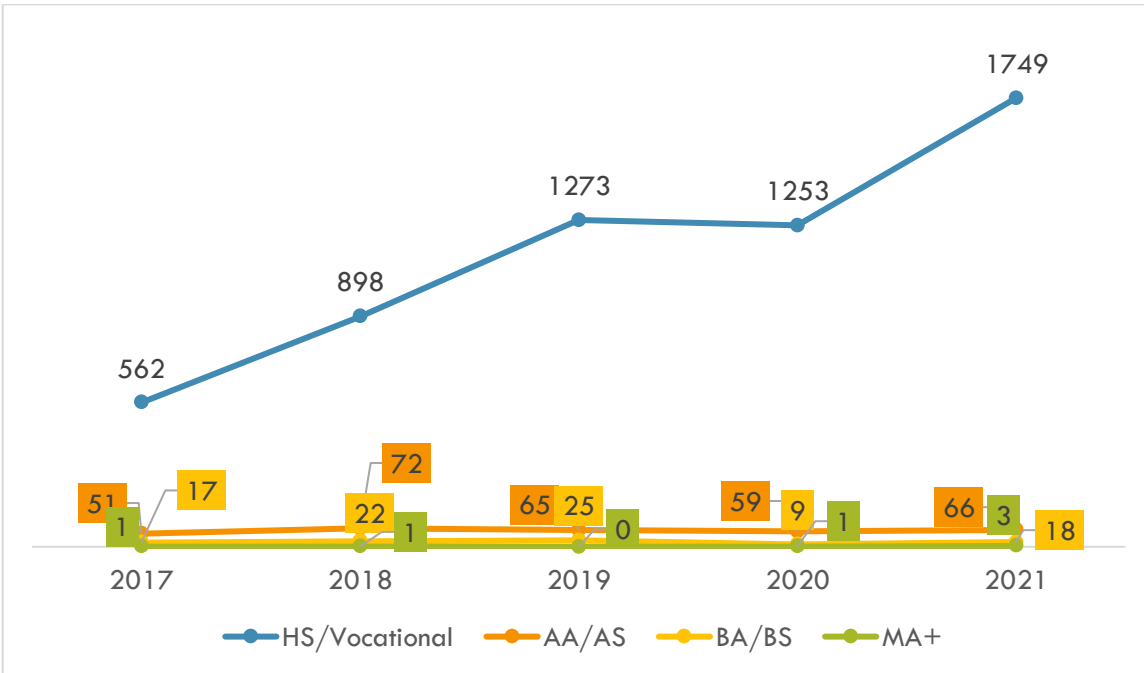
Skills	Job Postings, Full Year 2021
Driver’s License	1,243
Security Clearance	103
First Aid CPR AED	50
OSHA Forklift Certification	38
Applicator’s License	34

Source: Labor Insight/Jobs (Burning Glass)

Job Postings - Minimum Educational Attainment – Change Over Time

Exhibit 10 displays the change in job advertisements over the last five years for Machining and Machine Tools, according to the minimum advertised education. In 2021, there were 1,836 total job ads posted, with 1,749 of them requiring a high school diploma or vocational degree.

Exhibit 10: Educational Demand, Minimum Advertised



Source: Labor Insight / Jobs (Burning Glass)

Job Postings – Proportion of Job Postings by Minimum Educational Attainment Required

To gauge employer preference for candidates with particular education levels, the proportion of job postings by minimum advertised education appears in Exhibit 11. Employers posting job ads for Machining and Machine Tools have frequently sought candidates with a high school diploma or vocational degree, ranging from a low of 89% in 2017 to a high of 95% in 2020 and 2021.

Exhibit 11: Occupational Demand by Education, Minimum Advertised

Minimum Education Requirement	2017	2018	2019	2020	2021
HS Diploma / Vocational Training	89%	90%	93%	95%	95%
Associate Degree	8%	7%	5%	5%	4%
Bachelor's Degree	3%	2%	2%	1%	1%
Graduate Degree	0%	0%	0%	0%	1%

Source: Labor Insight/Jobs (Burning Glass)

Education and Training

Exhibit 12 shows the typical entry-level education requirement for the occupations of interest, along with the typical on-the-job training needed to attain competency in the occupation.

Exhibit 12 – Education and Training Requirements

SOC	Occupation	Typical entry-level education	Typical on-the-job training
49-9071	Maintenance and Repair Workers, General	High school diploma or equivalent	Moderate-term on-the-job training
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	High school diploma or equivalent	Moderate-term on-the-job training
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	High school diploma or equivalent	Moderate-term on-the-job training
51-4041	Machinists	High school diploma or equivalent	Long-term on-the-job training
51-9161	Computer Numerically Controlled Tool Operators	High school diploma or equivalent	Moderate-term on-the-job training
51-9198	Helpers – Production Workers	High school diploma or equivalent	Short-term on-the-job training

Source: Bureau of Labor Statistics Employment Projections (Educational Attainment)

Regional Completions and Openings

There were 317 regional completions (2020) and 1,644 regional openings (2020) in the South Central Coast region in programs related to the occupations identified as aligned with Machining and Machine Tools.

Exhibit 13 – Completions and Openings

16 Regional Institutions had Related Programs (2020)	317 Regional Completions (2020)	1,644 Annual Openings (2020)
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Source: Economic Modeling Specialists International (EMSI)

Related Programs

CIP Code	Program	Completions (2020)
48.0508	Welding Technology/Welder	81
47.0101	Electrical/Electronics Equipment Installation and Repair Technology/Technician, General	51
47.0603	Autobody/Collision and Repair Technology/Technician	44
47.0105	Industrial Electronics Technology/Technician	33
47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	29
46.0415	Building Construction Technology/Technician	27
15.0501	Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician	24
15.0613	Manufacturing Engineering Technology/Technician	22
48.0503	Machine Shop Technology/Assistant	5
48.0501	Machine Tool Technology/Machinist	1
46.0503	Plumbing Technology/Plumber	0

Source: Economic Modeling Specialists International (EMSI)

CCC and Non-CCC Awards

Exhibit 14 lists the number of completers from programs related to Machining and Machine Tools in the South Central Coast Region.

Exhibit 14 – CCC and Non-CCC Awards the South Central Coast Region, 2020

CCC Programs	Completers
Antelope Valley	89
Oxnard	40
Allan Hancock	37
College of the Canyons	35
Cuesta College	32
Ventura	24
Santa Barbara City College	1
Moorpark College	0
Non-CCC Programs	Completers
CET - Oxnard	21
San Joaquin Valley College - Lancaster	18
Santa Barbara Business College – Santa Maria	11
CET – Santa Maria	9

Source: Economic Modeling Specialists International (EMSI)

Student Outcomes

The CTE LaunchBoard provides student outcome data on the effectiveness of CTE programs. The following student outcome information was collected from exiters of regional Machining and Machine Tools Program (TOP: 0956.30) for the 2018-19 academic year.

- Completers of Machining and Machine Tools programs from the 2018-2019 academic year in the South Central Coast region had a **median annual wage upon completion of \$43,778**.
- 55% of students are **employed within a year** after completing a program.
- 58% of students **attained a living wage** within a year of completion.
- Completers experienced an average of **+37%** change in earnings after exiting.
- 84% of students were **part-time**, 22% **skill builders**, 40% **first-generation**, and 73% **economically disadvantaged**.

Sources

O*Net Online, Labor Insight/Jobs (Burning Glass), Economic Modeling Specialists International (EMSI), MIT Living Wage Calculator, Bureau of Labor Statistics (BLS) Education Attainment, California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart, CTE LaunchBoard, Statewide CTE Outcomes Survey, Employment Development Department Unemployment Insurance Dataset

Notes

Data included in this analysis represent the labor market demand for relevant positions most closely related to Machining and Machine Tools. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study and can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions. All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; 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 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.