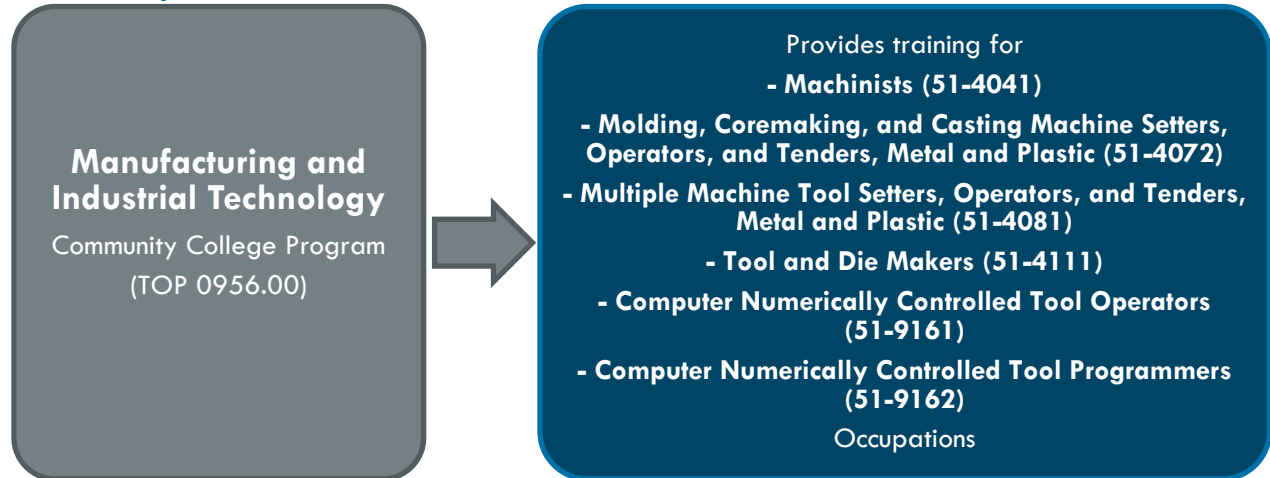


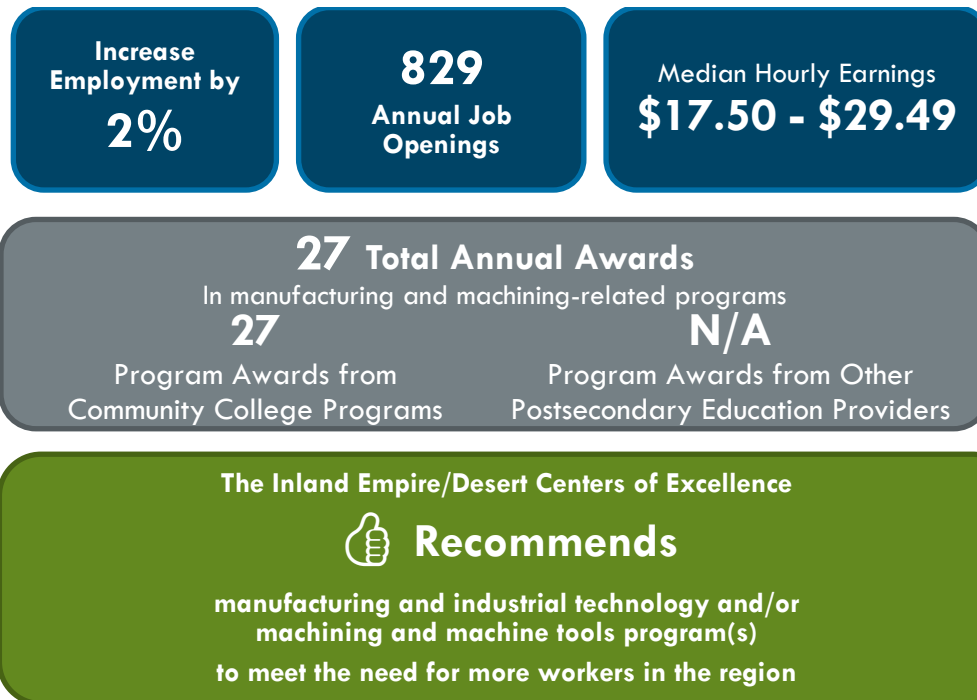
# Manufacturing and Machining

*Inland Empire/Desert Region (Riverside and San Bernardino counties)*

## Summary



Over the next five years (2022-2027), employment for the manufacturing and machining occupational group is projected to:



## Introduction

California Community College manufacturing and industrial technology (TOP 0956.00) programs prepare students for employment through the instruction of engineering principles and technical skills for the manufacture of products and related industrial processes. It includes shaping and forming operations, materials handling, instrumentation and controls, quality control, Computer Aided Manufacturing, robotics, optimization theory, industrial and manufacturing planning, and related management skills (Taxonomy of Programs, 2023). The knowledge, skills, and abilities trained by manufacturing and industrial technology programs lead to employment in the manufacturing and machining occupational group.

- Machinists (51-4041)
- Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (51-4072)
- Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (51-4081)
- Tool and Die Makers (51-4111)
- Computer Numerically Controlled Tool Operators (51-9161)
- Computer Numerically Controlled Tool Programmers (51-9162)

## Job Demand

In 2022, there were 7,416 jobs in the manufacturing and machining occupational group in the Inland Empire/Desert Region. Regional employment for this occupational group is projected to increase by 2% through 2027 – 829 job openings are projected annually. Exhibit 1 displays the job counts, five-year projected job growth, and job openings in the region. Exhibit 1 is sorted from highest to lowest number of annual openings.

*Exhibit 1. Five-year projections for the manufacturing and machining occupational group, Inland Empire/Desert Region, 2022-2027*

Occupation	2022 Jobs	2027 Jobs	5-Yr % Change	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)
Machinists	3,104	3,191	3%	1,762	352
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2,134	2,142	0%	1,133	227
Computer Numerically Controlled Tool Operators	1,192	1,178	(1%)	623	125
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	505	555	10%	329	66
Computer Numerically Controlled Tool Programmers	260	287	10%	168	34
Tool and Die Makers	220	226	2%	129	26
<b>Total</b>	<b>7,416</b>	<b>7,577</b>	<b>2%</b>	<b>4,144</b>	<b>829</b>

Source: Lightcast 2023.3

An online job ad search for the manufacturing and machining occupational group was conducted to reveal the employers seeking these workers, including the median posting duration, earnings information, and in-demand skills. Exhibit 2 displays the number of job ads posted for the manufacturing and machining occupational group over the last 12 months and the median posting duration. Over the previous 12 months, there were 922 job ads for the manufacturing and machining occupational group in the region (sorted from highest to lowest number of job ads).

*Exhibit 2. Job ads and posting duration, Inland Empire/Desert Region, November 2022 through October 2023*

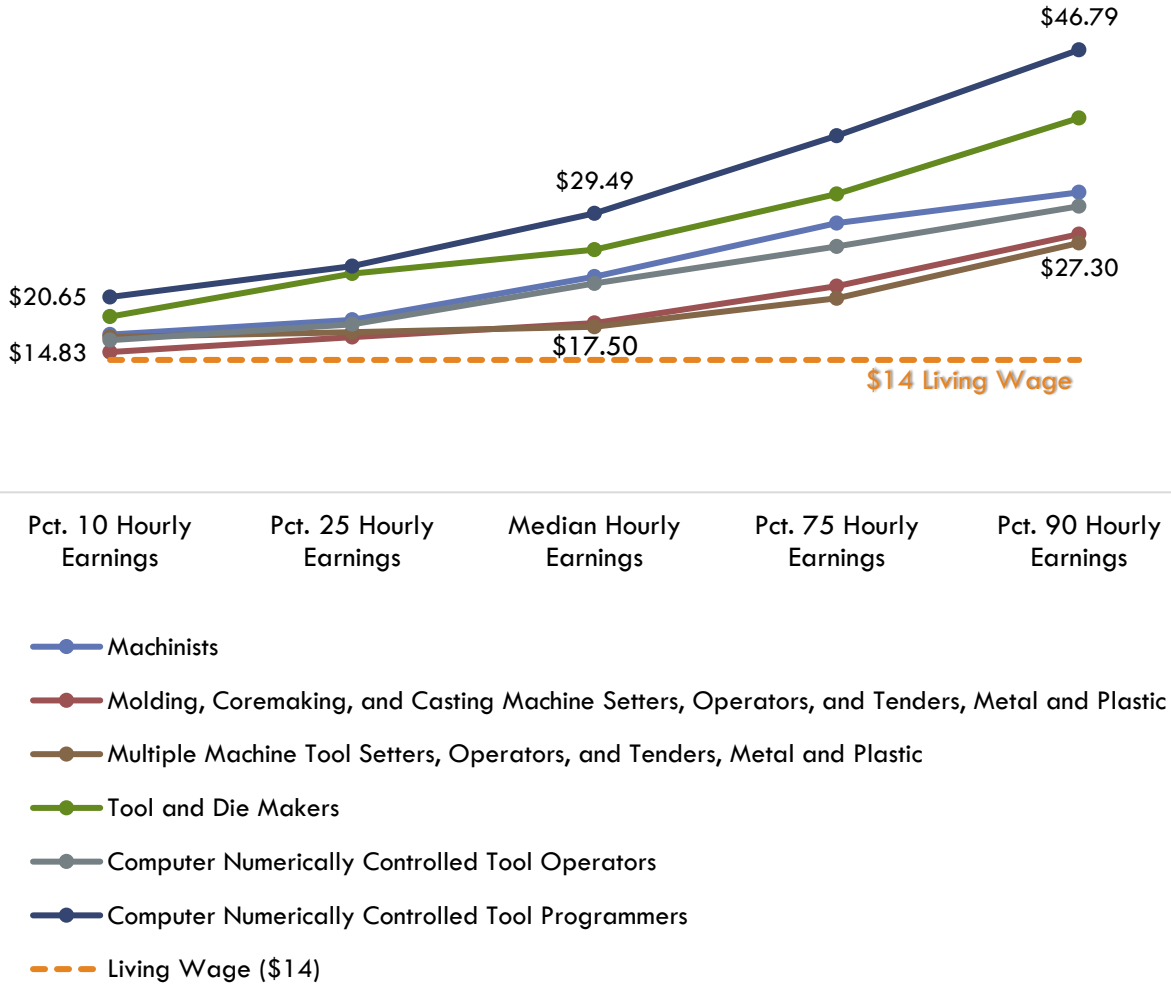
Occupation	Job Ads	Median Posting Duration (Days)
Computer Numerically Controlled Tool Operators	391	25
Machinists	337	25
Computer Numerically Controlled Tool Programmers	99	24
Tool and Die Makers	39	24
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	38	25
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	18	18
<b>Total</b>	<b>922</b>	<b>--</b>

Source: Lightcast 2023.3

## Earnings

The living wage for one adult in the Inland Empire (Riverside and San Bernardino) is \$14 per hour or \$29,120 annually. Exhibit 3 displays the hourly earnings for the manufacturing and machining occupational group. Most notable is that all six occupations have entry-level hourly wages above the living wage estimate.

*Exhibit 3. Hourly earnings by percentile for the manufacturing and machining occupational group, Inland Empire/Desert Region, 2022*

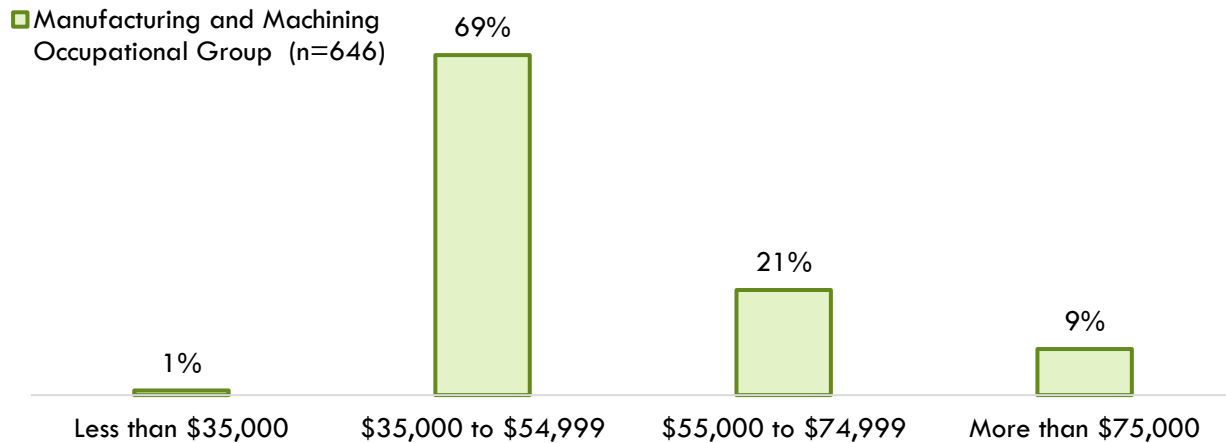


Source: Lightcast 2023.3

## Advertised Salary from Online Job Ads

Exhibit 4 displays the regional online advertised salaries for the manufacturing machining occupational group over the last 12 months. Online job ads salary information reveals that most employers (69%) advertise an annual salary between \$35,000 and \$54,999.

*Exhibit 4. Online advertised salaries for the manufacturing and machining occupational group, Inland Empire/Desert Region, November 2022 through October 2023*



Source: Lightcast 2023.3

## Online Job Advertisements: Job Titles, Employers, Skills, Education, & Work Experience

Exhibit 5 displays the job titles most frequently used in manufacturing and machining job ads over the last 12 months. Displaying advertised job titles may provide insight into the types of positions sought by employers.

*Exhibit 5. Job titles most frequently used in manufacturing and machining job ads, Inland Empire/Desert Region, November 2022 through October 2023*

Job Titles	Unique Job Ads
Machinists	89
CNC Machinists	82
CNC Programmers	61
CNC Operators	50
CNC Machine Operators	47
CNC Lathe Operators	45
Machine Operators	40
CNC Operators/Machinists	35
CNC Set Up Operators	33
CNC Lathe Machinists	25

Source: Lightcast 2023.3

Exhibit 6 displays the employers posting the most job ads for the manufacturing and machining occupational group during the last 12 months. Showing employer names provides insight into where students may find employment after completing a program. Aerotek posted the most job ads for the manufacturing and machining occupational group over the last 12 months.

*Exhibit 6. Employers posting the most job ads for the manufacturing machining occupational group, Inland Empire/Desert Region, November 2022 through October 2023*

Top Employer	Unique Job Ads
Aerotek	78
Flag Solutions	31
Flowserve	29
Randstad	24
Key Skilled Personnel	20

Source: Lightcast 2023.3

Exhibit 7 lists a sample of specialized and employability skills employers list when seeking workers to fill manufacturing and machining positions. Specialized skills are occupation-specific skills that employers request for industry or job competency. Common skills are foundational skills that transcend industries and occupations; this category is often referred to as "soft skills." The skills requested in job ads may be utilized to guide curriculum development.

*Exhibit 7. Sample of in-demand skills from employer job ads, Inland Empire/Desert Region, November 2022 through October 2023*

Specialized skills	Common skills
<ul style="list-style-type: none"> <li>• Machining</li> <li>• Lathes</li> <li>• Computer Numerical Control (CNC)</li> <li>• Mills</li> <li>• Tooling</li> <li>• CNC Machining</li> <li>• Micrometer</li> <li>• Calipers</li> <li>• Blueprinting</li> <li>• Metal Lathes</li> </ul>	<ul style="list-style-type: none"> <li>• Operations</li> <li>• Communications</li> <li>• Troubleshooting</li> <li>• Mathematics</li> <li>• Detail Oriented</li> <li>• Problem Solving</li> <li>• Management</li> <li>• Lifting Ability</li> <li>• Mechanical Aptitude</li> <li>• Teamwork</li> </ul>

Source: Lightcast 2023.3

Exhibit 8 displays the minimum advertised education requirements for the manufacturing and machining occupational group. According to the Bureau of Labor Statistics, between 28% and 48% of incumbent workers in this field hold a community college-level of educational attainment; "some college, no degree," and an "associate degree." Only 38% of employer job ads included minimum education requirements. Most employer job ads (95%) sought a candidate holding a high school diploma or GED (equivalent) as a minimum education requirement.

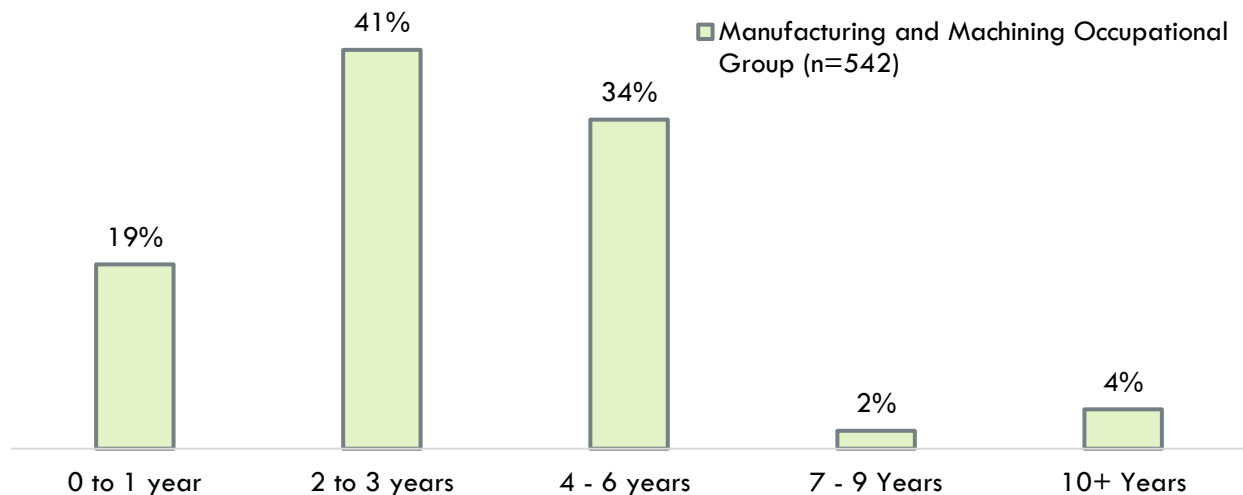
*Exhibit 8. Minimum advertised education requirements, Inland Empire/Desert Region, November 2022 through October 2023*



Source: Lightcast 2023.3

Exhibit 9 displays the work experience typically required from employer job ads for the manufacturing and machining occupational group. The majority (41%) of employers listing minimum experience requirements sought candidates with two (2) to three (3) years of previous work experience.

*Exhibit 9. Real-time work experience requirements, Inland Empire/Desert Region, November 2022 through October 2023*



Source: Lightcast 2023.3



## Certifications

Exhibit 10 displays the most frequently requested certifications by employers in job advertisements.

Job advertisements reveal that employers value the Forklift certification.

*Exhibit 10: Certifications most frequently required by employers, Inland Empire/Desert Region, November 2022 through October 2023*

Certification	Jobs Ads
Forklift Certification	35
CNC Machining Certification	24
Six Sigma Certification	19
Certified Associate in Project Management	8
Project Management Professional Certification	7

Source: Lightcast 2023.3

## Student Completions and Programs Outcomes

Exhibit 11 displays student completions for Manufacturing and Industrial Technology (TOP 0956.00) and Machining and Machine Tools (TOP 0956.30) programs over the last three academic years (2019-2022). In the previous three academic years, two regional community colleges issued an average of 27 awards in relevant programs.

*Exhibit 11. Annual average community college awards for manufacturing and industrial technology (0956.00) and machining and machine tools (0956.30) programs, Inland Empire/Desert Region, 2019-2022*

TOP Code	Program	College	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Award Average
0956.00	Manufacturing and Industrial Technology	Norco	15	8	4	9
		San Bernardino Valley	2	-	3	2
<b>Supply Subtotal/Average</b>			<b>17</b>	<b>8</b>	<b>7</b>	<b>11</b>
0956.30	Machining and Machine Tools	Norco	15	7	9	10
		San Bernardino Valley	6	2	9	6
<b>Supply Subtotal/Average</b>			<b>21</b>	<b>9</b>	<b>18</b>	<b>16</b>
<b>Supply Total/Average</b>			<b>38</b>	<b>17</b>	<b>25</b>	<b>27</b>

Source: MIS Data Mart

California program outcome data may provide useful insight into the likelihood of success for the proposed program. Community college student outcome information based on the selected TOP code and region is provided in Exhibit 12.

*Exhibit 12. 0956.00 – Manufacturing and Industrial Technology strong workforce program outcomes, Inland Empire/Desert Region, most recent academic year*

<b>Strong Workforce Program Metrics: 0956.00 – Manufacturing and Industrial Technology</b>	<b>Inland Empire/Desert Region</b>	<b>California</b>
Unduplicated count of enrolled students (2021-22)	50	3,670
Completed 9+ career education units in one year (2021-22)	32%	31%
Students who attained a noncredit workforce milestone in a year (2021-22)	N/A	14%
Students who earned a degree, certificate, or attained apprenticeship	12 (2019-20)	386 (2021-22)
Job closely related to the field of study	88% (2018-19)	79% (2019-20)
Median annual earnings (all exiters) (2020-21)	\$42,560 (\$20.46)	\$47,028 (\$22.61)
Median change in earnings (all exiters) (2020-21)	18%	31%
Attained a living wage (completers and skills-builders) (2020-21)	68%	67%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

**Non-Community College Supply**

No award completion data is available for Manufacturing Engineering Technology/Technician (CIP 15.0613); Machine Tool Technology/Machinist (CIP 48.0501); Industrial and Product Design (CIP 50.0404) in the Inland Empire/Desert Region.

## Summary of Findings & Recommendation

Over the next five years, the manufacturing and machining occupational group is projected to have 829 annual job openings and increase employment by 2% in the Inland Empire/Desert Region. All six occupations pay hourly wages above the living wage estimate (\$14).

Over the last three academic years, 2 regional community colleges have issued 27 annual average awards in manufacturing and industrial technology (TOP 0956.00) and machining and machine tools (TOP 0956.30) programs. Non-community college postsecondary education institutions did not issue any awards in manufacturing and/or machining-related programs over the past two years. In total, regional institutions issued 27 manufacturing and machining-related awards annually, on average.

The Centers of Excellence finds that there is a regional need for manufacturing and machining training programs to meet the regional demand for more workers. Colleges considering this program should partner with applicable employers to document their demand for manufacturing and machining workers and the skills/certifications required for students to earn a living wage after exiting the program.

### Contact

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November 2023

## References

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## Appendix: Methodology

Exhibit 11 displays the average annual California Community College (CCC) awards conferred during the three academic years between 2019 and 2022 from the California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. Awards are the combined total during the timeframe, divided by three in this case to calculate an annual average. This is done to minimize the effect of atypical variations that might be present in a single year.

Community college student outcome information is from LaunchBoard and based on the selected TOP code and region. These metrics are based on records submitted to the California Community Colleges Chancellor's Office Management Information Systems (MIS) by community colleges, which come from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from California's Employment Development Department's Unemployment Insurance database. When available, outcomes for completers are reported to demonstrate the impact that earning a degree or certificate can have on employment and earnings. For more information on the types of students included for each metric, please see the web link for LaunchBoard's Strong Workforce Program Metrics Data Element Dictionary in the References section (LaunchBoard, 2023a). Finally, employment in a job closely related to the field of study comes from self-reported student responses on the CTE Employment Outcomes Survey (CTEOS) administered by Santa Rosa Junior College (LaunchBoard, 2023a).

Table 1. 2022 to 2027 job growth, wages, entry-level education, training, and work experience required for the manufacturing and machining occupational group in the Inland Empire/Desert Region (Riverside and San Bernardino Counties combined)

Occupation (SOC)	2022 Jobs	5-Year Change	5-Year % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage (10 <sup>th</sup> to 90 <sup>th</sup> percentile)	Median Hourly Wage (50 <sup>th</sup> percentile)	Average Annual Earnings	Entry-Level Education & On-The-Job-Training	Work Experience Required
Machinists (51-4041)	3,104	87	3%	352	\$16.68 to \$31.72	\$22.81	\$50,074	High school diploma or equivalent & Long-term	None
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (51-4072)	2,134	7	0%	227	\$14.83 to \$27.30	\$17.90	\$40,643	High school diploma or equivalent & Moderate-term	None
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (51-4081)	505	50	10%	66	\$16.43 to \$26.37	\$17.50	\$40,558	High school diploma or equivalent & Moderate-term	None
Tool and Die Makers (51-4111)	220	5	2%	26	\$18.57 to \$39.58	\$25.66	\$58,271	Postsecondary nondegree award & Long-term	None
Computer Numerically Controlled Tool Operators (51-9161)	1,192	(15)	(1%)	125	\$16.09 to \$30.25	\$22.08	\$47,208	High school diploma or equivalent & Moderate-term	None
Computer Numerically Controlled Tool Programmers (51-9162)	260	27	10%	34	\$20.65 to \$46.79	\$29.49	\$65,864	Postsecondary nondegree award & Moderate-term	None
<b>Total</b>	<b>7,416</b>	<b>162</b>	<b>2%</b>	<b>829</b>	-	-	-	-	-

Source: Lightcast 2023.3