

ADVANCED MANUFACTURING

MIDDLE-SKILL JOBS IN THE SAN DIEGO-IMPERIAL REGION



Advanced Manufacturing

This summary highlights key points from the Advanced Manufacturing section a broader study, *Sector Analysis: Demand and Supply of Middle-Skill Jobs in the Priority & Emerging Sectors*. Companies in the Advanced Manufacturing sector create products to solve many of today's most challenging problems. High-tech manufacturing (i.e., Advanced Manufacturing) jobs continue to grow, especially in the areas of 3-D printing, and high-speed, computerized numerical control machining. Because robots and automation take care of the repetitive work, today's manufacturing employees have more challenging and interesting job assignments. Employers in this sector look for technicians who are at ease in the mechanical world and able to apply scientific and technical principles to manufacturing processes. Opportunities for advancement are plentiful as technological advancements make higher-skill jobs in product design, process engineering, operations, maintenance, and lab work more prevalent.

Sector Overview



114,370
people employed



2% (2,206)
5-year projected job growth



3,370
businesses



8%
of the sector's
employment in California



\$101,641
average earnings
per job



8%
of the sector's
businesses in California

The Advanced Manufacturing sector accounts for 114,370 jobs in the San Diego-Imperial region and 8% of all Advanced Manufacturing jobs in California. There are approximately 3,370 establishments in the region, making up 8% of California's Advanced Manufacturing businesses. This sector is projected to grow 2% (or 2,206 jobs) in the next five years in the San Diego-Imperial region. The average earnings per Advanced Manufacturing job are \$101,641.¹

Sample of Local Employers and Resources



General Atomics

GKN Aerospace

UTC Aerospace Systems

BAE Systems

DanoneWave

Teledyne Technologies

Northrop Grumman

Cymer Incorporated

Orbital ATK

¹Emsi. Class of Worker: QCEW + Non-QCEW + Self-Employed. Timeframe: 2018-2023. Data set 2019.01.



Middle-Skill Jobs

Middle-skill jobs are occupations that community college students would be best prepared for after obtaining a certificate or degree. The top middle-skill jobs for the Advanced Manufacturing sector are included below.

Middle-Skill Jobs Attainable with a Community College Education, San Diego-Imperial Region (2018-2023)²

Occupational Title	Annual Job Openings Demand	Entry-Level ³ Hourly Earnings	Median Hourly Earnings
Maintenance and Repair Workers, General	1,516	\$14.92	\$18.56
First-Line Supervisors of Production and Operating Workers	475	\$22.23	\$29.67
Welders, Cutters, Solderers, and Brazers	433	\$17.17	\$22.57
Machinists	421	\$16.47	\$21.73
Aircraft Mechanics and Service Technicians	390	\$25.89	\$29.66
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	389	\$13.35	\$16.12
Electrical and Electronics Engineering Technicians	278	\$25.03	\$32.43
Industrial Machinery Mechanics	263	\$22.21	\$27.00
Sheet Metal Workers	235	\$20.75	\$27.50
Engineering Technicians, Except Drafters, All Other	192	\$26.30	\$33.17
Structural Iron and Steel Workers	163	\$22.10	\$32.11
Computer-Controlled Machine Tool Operators, Metal and Plastic	161	\$16.34	\$21.60
Industrial Production Managers	142	\$38.77	\$47.82
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	130	\$14.53	\$19.03
Civil Engineering Technicians	129	\$17.76	\$24.92
Computer, Automated Teller, and Office Machine Repairers	122	\$14.29	\$17.15
Printing Press Operators	115	\$12.70	\$16.57
Electrical and Electronics Repairers, Commercial and Industrial Equipment	91	\$24.85	\$29.01

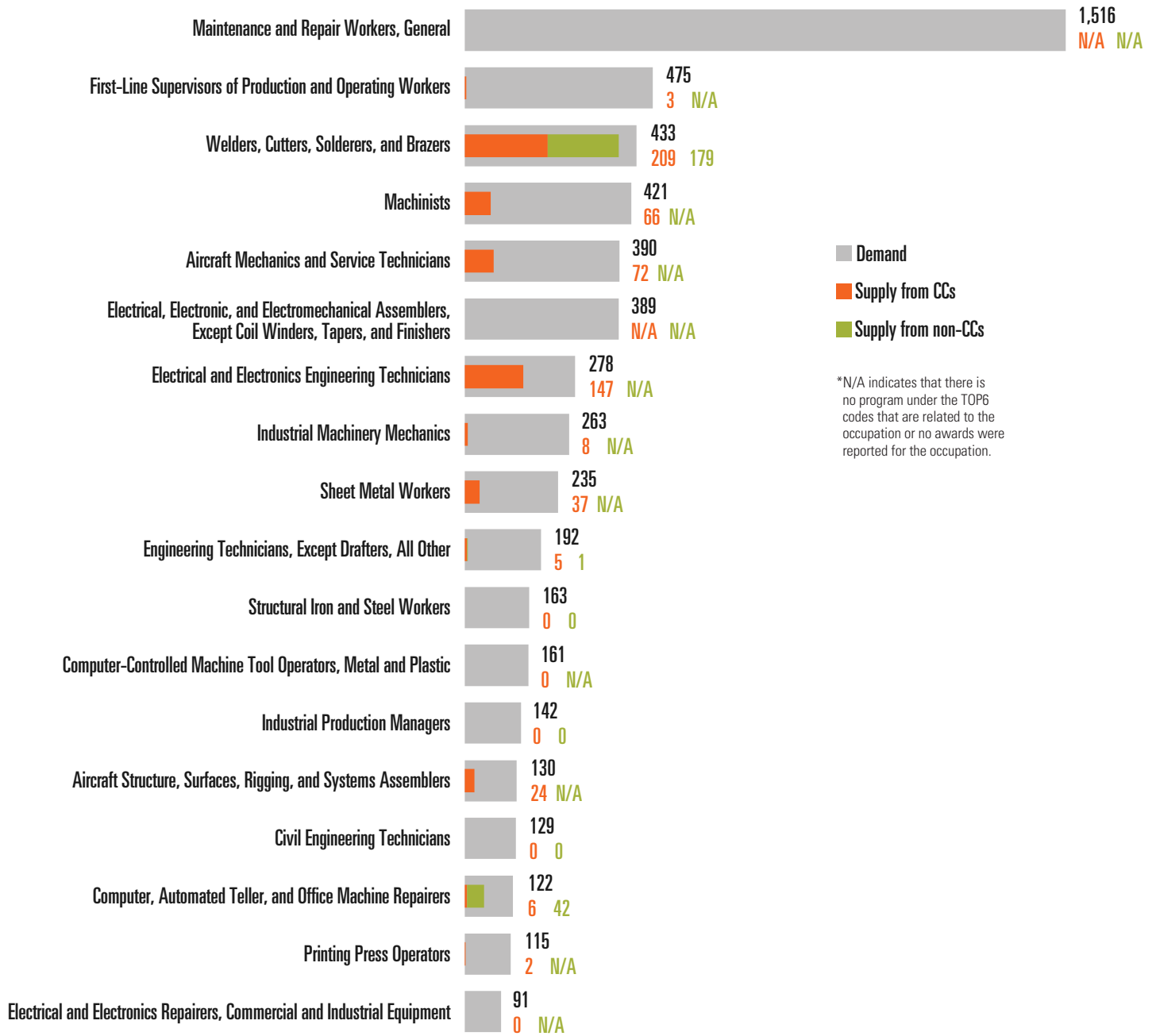
² Emsi. Class of Worker: QCEW + Non-QCEW + Self-Employed. Timeframe: 2018-2023. Data set 2019.01.

³ Individuals at the 25th percentile earn entry-level wages, while individuals at the median level earn median wages due to a more experience, more training, etc.

Labor Market Demand, Program Supply, and Supply Gaps

Top middle-skill jobs are defined as occupations with the most labor market demand, stable employment growth, and entry-level wages at or above the Self-Sufficiency Standard.⁴ Comparing labor market demand with program supply suggests that the **top middle-skill jobs in this sector have supply gaps in the San Diego-Imperial region**. Labor market demand is defined as the number of average annual job openings per year that employers expect to fill for a particular occupation. Program supply is the number of awards (e.g., degrees, certificates) from community colleges and other training providers.

Advanced Manufacturing Top Middle-Skill Jobs: Demand vs. Supply, San Diego-Imperial Region



⁴ The Self-Sufficiency Standard is the hourly wage that a single adult needs to earn to meet basic needs in San Diego County or Imperial County. selfsufficiency.org.

Key Findings and Recommendations

Between July and December 2018, industry experts and the community colleges in the San Diego-Imperial region met and reviewed labor market demand and program supply for middle-skill jobs in the Priority and Emerging Sectors. The objectives of the meetings were to identify labor market supply gaps in middle-skill jobs; understand where programs exist or do not exist to fill in the supply gaps; and discuss how the region's community colleges could close the supply gaps. The following summarizes the findings and recommendations for the Advanced Manufacturing sector.

1 Public perception limits youth enrollment for existing programs: Parents and youth's perception of manufacturing has not caught up with the technological advancements in the sector. Manufacturing businesses are seen as dirty, dark, and dangerous factories, which contribute to low youth enrollments. In fact, 41% of students enrolled in Advanced Manufacturing programs are ages 24 or younger, while 54% of students in community college programs overall are ages 24 or younger.⁵

To increase youth enrollment numbers, the colleges should collaborate with employers, K-12 educators, and workforce development agencies to improve the public's understanding of the Advanced Manufacturing sector, specifically focusing on the sector's well-paying middle-skill jobs. The community colleges should also work with middle school and high school counselors, faculty, and other stakeholders to encourage students to enroll in existing community college programs if their interests and strengths align with the sector's jobs.

2 Advanced Manufacturing companies have an aging workforce: 26% of workers in this sector are ages 55 and older, suggesting that in approximately 10 years, these workers will retire; employers will need a talent pipeline to fill in labor gaps caused by attrition.⁶

To increase exposure to this sector, the Deputy Sector Navigator (DSN) for Advanced Manufacturing should help the K-12 and community college systems align their programs and prepare students for the world of work in this sector. The DSN should also work with employers to set up tours (or other events) to expose students to manufacturers. One opportunity, for example, would be Manufacturing Day in October where hundreds of manufacturers throughout the region open their doors once a year to the public to "inspire the next generation of manufacturers."⁷

3 The top middle-skill jobs in this sector have large labor market demand, but small program supply: Comparing demand and supply of the top middle-skill jobs in this sector indicates that there is a supply gap of more than 4,000 awards.

To increase retention and success of students in Advanced Manufacturing programs, faculty, deans, and the DSN should review program and course data to determine if there are barriers that prevent students from successfully completing a program (e.g., challenging introductory courses). Strong Workforce Program (SWP) funds could be invested at the college level to address students' specific barriers to course/program retention and completion.

4 Employers hiring students before they complete training: Once students get foundational skills for jobs in the Advanced Manufacturing sector, manufacturers hire them before program completion and train them to their firm's standards. 92% of manufacturers in the region are small businesses, employing 150 employees or less. Small manufacturers prefer workers with skills specific to their business and have developed in-house training to meet those specialized needs.⁸

To increase completion numbers in Advanced Manufacturing programs, faculty, deans, and the DSN should review program curriculum and identify programs that may be "over-designed." These are programs that offer more courses than what may be needed in the labor market, creating long-term programs that could actually be shortened by offering fewer courses/credits yet still prepare students for small companies' needs.

5 Program growth is limited because of faculty, space, and equipment: Community college faculty reported that programs are at capacity and are impacted, including programs offered during the evening or after normal business hours. Additionally, only a few community college facilities have enough space for the necessary training equipment and machines.

To increase program capacity, community colleges with Advanced Manufacturing programs should review current offerings and determine if they are a priority for that college's future goals. If so, such programs could benefit from new and/or updated equipment funded by local SWP resources.

⁵ The California Community Colleges LaunchBoard. San Diego-Imperial. Advanced Manufacturing. Credit and Non-Credit. 2016-17.

⁶ Emsi. Class of Worker: QCEW + Non-QCEW + Self-Employed. Timeframe: 2018. Data set 2019.01.

⁷ mfgday.com

⁸ San Diego Workforce Partnership. Advanced Manufacturing. Labor Market Analysis. San Diego County. October 2014.

Key Findings and Recommendations *(continued from inside)*

6 Outcomes data (e.g., program supply numbers) is limited to what is reported: The region offers not-for-credit (fee-based) Advanced Manufacturing programs and they are not required to report their outcomes data to the California Community Colleges Chancellor's Office. Additionally, the region may be supplying more qualified workers than the data suggests because employers hire students before they actually complete training. (Only students who complete training are considered "completers" and counted in program supply.)

To better understand the completion (supply) numbers in Advanced Manufacturing programs, the DSN could collaborate with:

- The not-for-credit providers to determine their supply for Advanced Manufacturing middle-skill jobs and develop a more robust analysis of the demand, supply, and supply gaps for this sector.
- The Center of Excellence for Labor Market Research to create a list of related apprenticeship programs, nonprofit programs, etc. in the region to better understand the labor market supply for the sector.

7 Third-party certificates are valued in this sector, but it is unclear exactly which programs train for industry-recognized certificates and how many students actually obtain them: There is no standardized system that tracks data for third-party certifications.

To better understand industry-recognized certification numbers, the region should create an inventory of the third-party credentials and skills taught at each college across credit, noncredit, and not-for-credit (fee-based) programs, and validate with employers which skills and credentials...

- Could be combined for short-term certificates (less than 8 weeks)
- They would pay to send current/incumbent workers for upskilling (e.g., contracted education)

8 Knowledge, Skills, and Abilities (KSAs) for the sector have not been validated by employers: This brief examines job gaps, but does not explore the specific KSAs taught at the colleges and compare them to the labor market's demand for Advanced Manufacturing KSAs.

To determine if the region's community colleges are training for the right KSAs, the DSN should convene employers in a "regional advisory group" where employers can review program KSAs, provide feedback, and validate the KSAs' current relevance and demand in the labor market.

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.



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