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Expanding Apprenticeships: High-Opportunity Occupations

San Diego County

SAN DIEGO & IMPERIAL
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Table of Contents

Executive Summary

Recognized as a proven strategy for preparing workers for quality careers and helping employers address workforce shortages, apprenticeships continue to receive strong policy and funding support. In the San Diego and Imperial region, expanding apprenticeship opportunities remains a priority for diversifying career pathways and strengthening workforce pipelines.

This report builds on prior research by updating the list of apprenticeable occupations and applying additional criteria to assess long-term program viability. Using available labor market information, the San Diego & Imperial Center of Excellence (COE) identified 78 high-wage, high-demand apprenticeable occupations in San Diego County.

To strengthen this analysis, the COE evaluated these occupations using two additional indicators:

Retirement pressure, measured by the share of workers age 55 or older

AI resilience, based on the likelihood that core occupational tasks can be automated or augmented

This analysis identified:

- 34 occupations with a higher-than-average share of workers nearing retirement, indicating potential replacement demand
- 43 occupations with high AI resilience, reflecting greater stability in the face of technological change
- 17 occupations that meet both criteria, representing priority areas for apprenticeship expansion

Regional partners can use the findings to:

1) Identify new opportunities to diversify apprenticeship programs beyond traditional sectors
2) Engage employers in occupations facing retirement-driven workforce shortages
3) Develop and market programs aligned with occupations less susceptible to AI disruption
4) Prioritize a focused set of occupations when resources are limited

By combining current labor market data with forward-looking indicators, this report supports more informed strategic planning. However, labor market conditions evolve over time, and occupations that are in demand today may shift due to economic or technological disruption. Long-term success will depend on building flexible programs and preparing workers with adaptable skills that can respond to a changing economy.

Introduction

Federal and state governments have increased funding and policy support for apprenticeships in recent years,[1,2,3,4] recognizing them as an effective strategy to prepare workers for quality careers and address workforce shortages.[5,6]

At the regional level, the San Diego & Imperial Center of Excellence (COE) contributed to these efforts by examining existing programs, identifying occupations with strong potential for registered apprenticeship development, and recommending that the region expand capacity through dedicated apprenticeship staff positions.[7,8]

As regional partners continue expanding apprenticeship capacity,[9] the San Diego & Imperial COE developed this report to provide updated guidance for program development. This study updates the apprenticeable occupations list and identifies the most viable opportunities for apprenticeship programs. The analysis evaluates these occupations using several criteria below.

Prior COE studies focused on identifying apprenticeable occupations. This report builds on that work by updating the apprenticeable occupations list, which serves as the foundation for the analyses that follow. It then identifies high-priority occupations based on retirement pressure and AI resilience and concludes by showing how regional partners can use the findings to guide apprenticeship planning and decision-making.

APPRENTICEABLE OCCUPATION CRITERIA

- **Apprenticeship feasibility**, determined by occupations previously approved by the California Division of Apprenticeship Standards (DAS)
- **High-demand**, measured by five-year projected annual job openings
- **High-wage**, defined as entry-level wages that meet or exceed the regional living wage
- **Retiring workforce**, indicated by a high proportion of workers age 55 or older
- **AI resilience**, assessed by potential impacts from automation and generative AI

1 "Advancing Apprenticeship in California: Five-Point Action Plan," Department of Industrial Relations (DIR), July 2022, accessed February 1, 2026, dir.ca.gov/DAS/e-News/2022/Five-Point-Action-Plan.pdf.

2 "CAI Highlights," California Community Colleges Chancellor's Office, accessed February 1, 2026, cccco.edu/About-Us/Chancellors-Office/Divisions/Workforce-and-Economic-Development/apprenticeship/ca-apprenticeship-initiative.

3 "California Apprenticeship Initiative New and Innovative Grant Program Fiscal Year 2025-26 Request for Applications," California Community Colleges Chancellor's Office, accessed February 1, 2026, cccco.edu/-/media/CCCCO-Website/docs/rfa/apprenticeship

4 "California Announces More Than $22 Million in Apprenticeship Funding as the State Leads Nationally in Earn-And-Learn Opportunities." Department of Industrial Relations, accessed February 17, 2026. dir.ca.gov/DIRNews/2026/2026-18.html

5 Department of Labor (DOL). Apprenticeship. Accessed February 1, 2026, dol.gov/agencies/odep/program-areas/apprenticeship.

6 "Apprenticeships: Expanding Economic Opportunities," SCAG, June 2025, accessed February 1, 2026, scag.ca.gov/sites/defa ult/files/2025-06/25-429-IERS-0129-ApprenticeshipsReport-Final.pdf.

7 "Opportunities for Apprenticeships in San Diego & Imperial Counties," San Diego & Imperial COE, February 2024, coeccc.net/san-diego-imperial/2024/02/opportunities-for-apprenticeships-in-san-diego-imperial-counties.

8 "Building Apprenticeship Capacity in San Diego and Imperial Counties," San Diego & Imperial COE, February 2025, coeccc.net/san-diego-imperial/2025/02/building-apprenticeship-capacity.

9 sdiregionalconsortium.org/wp-content/uploads/2025/09/Consortium-Connection-September-2025.pdf

Updating the Apprenticeable Occupation List

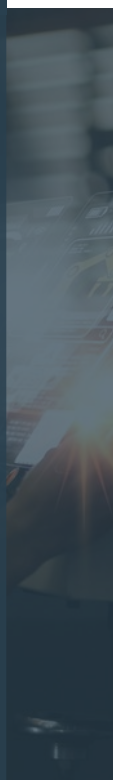
One of the primary recommendations from prior research was for the region to use the *apprenticeable occupations* list to guide the development of new apprenticeship programs and the expansion of existing ones.[10] Out of nearly 800 occupations in the Standard Occupational Classification (SOC) system, DAS has approved 282 occupations for registered apprenticeship programs.[11] Of those 282 DAS-approved occupations, the COE identified **78 high-wage, high-demand apprenticeable occupations** in San Diego County for this report. These occupations met the following thresholds: (1) prior approval by DAS; (2) strong projected demand between 2024 and 2029, defined as at least 50 annual job openings in San Diego County; and (3) entry-level wages at or above the county's living wage, defined as $26.01 per hour. Appendix A provides a detailed list of these occupations, including wage data and projected annual job openings.

Developing registered apprenticeship programs in these occupations would help diversify apprenticeship opportunities beyond the Energy, Construction, and Utilities (ECU) sector, which currently dominates the regional apprenticeship landscape. As of January 2026, San Diego County had 8,202 active registered apprentices, with 67% concentrated in the ECU sector.[12] Public Safety represented the second largest sector, with 1,224 active registered apprentices, or 15%.[13]

Exhibit 1 summarizes the 78 high-wage, high-demand apprenticeable occupations by sector. Expanding apprenticeship programs in these occupations would broaden opportunities in sectors such as Business & Entrepreneurship, Information & Communication Technologies (ICT) / Digital Media, and Advanced Manufacturing in San Diego County.

Exhibit 1. Number of High-Wage, High-Demand Apprenticeable Occupations by Sector

	# of Occupations
Business & Entrepreneurship	18
ICT / Digital Media	17
Advanced Manufacturing	11
Energy, Const., & Utilities	9
Adv. Transportation & Logistics	5
Health	5
Public Safety	5
Retail, Hospitality & Tourism	2
Ag., Water, & Env. Technologies	2
Edu. & Human Development	2
Life Sciences / Biotech	2



10 "Opportunities for Apprenticeships in San Diego & Imperial Counties," San Diego & Imperial COE, February 2024, coeccc.net/san-diego-imperial/2024/02/opportunities-for-apprenticeships-in-san-diego-imperial-counties.

11 DAS is the state agency responsible for regulating and approving apprenticeship programs.

12 As of January 1, 2026, these industries were represented in the "Industry Breakdown" list in the DAS Registration Dashboard. The San Diego & Imperial COE converted these 73 industries into one of the 11 California Community Colleges Chancellor's Office (CCCCO) sectors. For more information, please see Appendix D: Methodology.

13 Ibid.

Apprenticeable Occupations with a Large Retiring Workforce

The previous section identified 78 apprenticeable occupations in San Diego County that meet the region's high-wage and high-demand criteria. This section focuses on occupations with a large retiring workforce, as a higher share of workers nearing retirement signals increased replacement demand in the coming years. According to the American Community Survey (U.S. Census Bureau), approximately 21% of San Diego County's labor force was age 55 or older in 2024.[14]

Applying this benchmark, the San Diego & Imperial COE **identified 34 apprenticeable occupations in which the share of workers age 55 or older exceeds the county average**. These occupations represent fields where retirement pressure may increase hiring demand in the coming years. Exhibit 2 highlights these occupations from the broader list of high-wage, high-demand apprenticeable occupations.

Exhibit 2. Apprenticeable Occupations with a Large Retiring Workforce, San Diego County

SOC	Occupational Title	% Ages 55+
47-4011	Construction and Building Inspectors	42%
13-1051	Cost Estimators	40%
13-1111	Management Analysts	36%
11-9081	Lodging Managers	34%
43-6011	Executive Secretaries and Executive Administrative Assistants	34%
11-3012	Administrative Services Managers	33%
17-3023	Electrical and Electronic Engineering Technologists and Technicians	32%
49-9041	Industrial Machinery Mechanics	31%
13-1028	Buyers and Purchasing Agents	30%
11-9199	Managers, All Other	30%
11-3051	Industrial Production Managers	30%
13-2011	Accountants and Auditors	29%
51-1011	First-Line Supervisors of Production and Operating Workers	29%
47-2073	Operating Engineers and Other Construction Equipment Operators	28%

14 U.S. Census Bureau. "Sex By Age by Employment Status for The Population 16 Years and Over, San Diego County." American Community Survey, ACS 1-Year Estimate Selected Population Detailed Tables, 2024, Table B23001, data.census.gov.

SOC	Occupational Title	% Ages 55+
17-3026	Industrial Engineering Technologists and Technicians	28%
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	27%
17-2011	Aerospace Engineers	27%
13-1041	Compliance Officers	27%
51-8031	Water and Wastewater Treatment Plant and System Operators	27%
43-1011	First-Line Supervisors of Office and Administrative Support Workers	26%
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	26%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	25%
13-1199	Business Operations Specialists, All Other	25%
29-2061	Licensed Practical and Licensed Vocational Nurses	24%
13-1082	Project Management Specialists	24%
11-1021	General and Operations Managers	24%
17-3029	Engineering Technologists and Technicians, Except Drafters, All Other	24%
29-1141	Registered Nurses	23%
47-2121	Glaziers	23%
21-1021	Child, Family, and School Social Workers	22%
11-9121	Natural Sciences Managers	22%
15-1251	Computer Programmers	21%
11-2022	Sales Managers	21%
11-3071	Transportation, Storage, and Distribution Managers	21%

Workforce composition in these occupations indicates where replacement demand is likely to emerge in the coming years. Although many workers are retiring later,[15] the growing share of individuals nearing retirement age may still create labor shortages and gaps in institutional knowledge.[16] These findings help guide workforce development efforts to prepare the next generation of workers to fill these roles.

15 "More in U.S. Retiring, or Planning to Retire, Later," Gallup, July 2022, accessed February 1, 2026, news.gallup.com/poll/394943/retiring-planning-retire-later.aspx.

16 "What Will Happen To The Labor Market When Boomers Retire—Or Yet, Don't Leave The Workforce?," Forbes, February 2024, accessed February 1, 2026, forbes.com/sites/jackkelly/2024/02/26/what-will-happen-to-the-labor-market-when-boomers-retire-or-yet-dont-leave-the-workforce.

Apprenticeable Occupations with High AI Resilience

In addition to retirement pressure, the potential impact of artificial intelligence (AI) on occupational tasks may also influence the long-term viability of apprenticeship programs. Recent research suggests that generative AI will reshape many jobs by automating or augmenting specific tasks, particularly those involving routine documentation, administrative coordination, and standardized analysis.[17] At the same time, occupations that rely on hands-on technical work, safety-critical decision making, or in-person service delivery are generally less susceptible to AI disruption.[18]

To assess this risk, the San Diego & Imperial COE evaluated the 78 high-wage, high-demand apprenticeable occupations using findings from several national studies on AI exposure. These studies consistently show that clerical and administrative roles have the highest exposure to generative AI, while many skilled trades, healthcare occupations, and technical fields remain more resilient due to their reliance on physical execution, regulatory oversight, or complex judgment.[19,20]

Using these patterns, each occupation was assigned one of three AI resilience categories:

Low AI Resilience

A significant portion of core tasks—such as routine analysis, drafting, scheduling, or administrative coordination—could be automated or substantially augmented by AI

Medium AI Resilience

AI may automate or accelerate some tasks, but the occupation still relies on human judgment, accountability, or interpersonal interaction

High AI Resilience

The occupation primarily involves hands-on technical work, safety-critical decision making, or in-person services that are difficult to automate

17 OpenAI & University of Pennsylvania. (2023). GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models. arxiv.org/abs/2303.10130.

18 Brookings Institution. (2024). Generative AI, the American worker, and the future of work. brookings.edu/articles/generative-ai-the-american-worker-and-the-future-of-work

19 International Labour Organization. (2025). Generative AI and Jobs: A Refined Global Index of Occupational Exposure. ILO Working Paper 140. ilo.org/publications/generative-ai-and-jobs-refined-global-index-occupational-exposure

20 OECD. (2016). The Risk of Automation for Jobs in OECD Countries. OECD Social, Employment and Migration Working Papers No. 189. oecd.org/els/emp/automation-and-independent-work-in-a-digital-economy-policy-brief.pdf

These ratings do not represent predictions of job loss. Most research indicates that AI will affect specific tasks within occupations rather than eliminate entire roles. However, understanding where AI may reshape work can help inform decisions about which apprenticeship programs may offer more stable long-term workforce opportunities.

Based on this analysis, Exhibit 3 highlights the 43 apprenticeable occupations with high AI resilience and identifies those that also have a higher-than-average share of workers age 55 or older, indicating potential retirement pressure. As noted earlier, 21% of San Diego County's workforce was age 55 or older in 2024. Occupations exceeding this threshold may face increased replacement demand as experienced workers retire.

Appendix B provides the full set of AI resilience ratings (low, medium, and high) for all 78 high-wage, high-demand apprenticeable occupations identified earlier in this report.

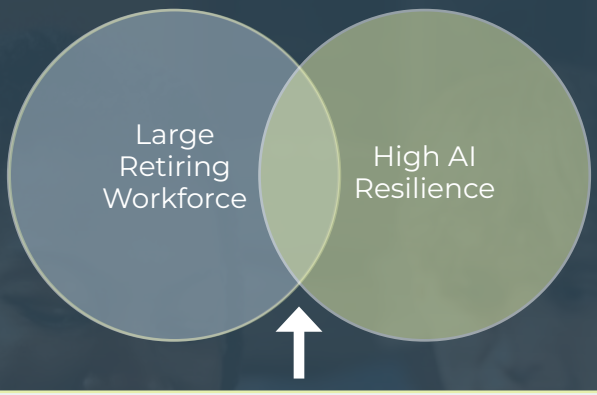
Exhibit 3. Apprenticeable Occupations with High AI Resilience and Large Proportion of Retiring Workforce in San Diego County

Occupational Title	AI Resilience	≥21% of Workforce Age 55+
Aerospace Engineers	High	✓
Avionics Technicians	High	
Biological Technicians	High	
Bus and Truck Mechanics and Diesel Engine Specialists	High	
Cement Masons and Concrete Finishers	High	
Child, Family, and School Social Workers	High	✓
Computer Hardware Engineers	High	
Computer Network Support Specialists	High	
Correctional Officers and Jailers	High	
Drywall and Ceiling Tile Installers	High	
Educational, Guidance, and Career Counselors and Advisors	High	
Electrical and Electronic Engineering Technologists and Technicians	High	✓
Electrical and Electronics Repairers, Commercial and Industrial Equipment	High	
Electrical Power-Line Installers and Repairers	High	
Electricians	High	
Engineering Technologists and Technicians, Except Drafters, All Other	High	✓
Firefighters	High	
First-Line Supervisors of Mechanics, Installers, and Repairers	High	✓
First-Line Supervisors of Production and Operating Workers	High	✓

Occupational Title	AI Resilience	≥21% of Workforce Age 55+
Forest and Conservation Technicians	High	
Glaziers	High	✓
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	High	
Industrial Engineering Technologists and Technicians	High	✓
Industrial Machinery Mechanics	High	✓
Industrial Production Managers	High	✓
Information Security Analysts	High	
Licensed Practical and Licensed Vocational Nurses	High	✓
Lodging Managers	High	✓
Medical Equipment Preparers	High	
Mobile Heavy Equipment Mechanics, Except Engines	High	✓
Operating Engineers and Other Construction Equipment Operators	High	✓
Police and Sheriff's Patrol Officers	High	
Probation Officers and Correctional Treatment Specialists	High	
Radiologic Technologists and Technicians	High	
Registered Nurses	High	✓
Security and Fire Alarm Systems Installers	High	
Sheet Metal Workers	High	
Structural Iron and Steel Workers	High	
Surgical Technologists	High	
Telecommunications Equipment Installers and Repairers, Except Line Installers	High	
Telecommunications Line Installers and Repairers	High	
Transportation, Storage, and Distribution Managers	High	✓
Water and Wastewater Treatment Plant and System Operators	High	✓

High-Priority Apprenticeable Occupations

The previous sections identified (1) apprenticeable occupations with a large retiring workforce and (2) those with high AI resilience. This section identifies the overlap between these two groups, as shown in the Venn diagram below.



17 High-Priority Apprenticeable Occupations

- Aerospace Engineers
- Child, Family, and School Social Workers
- Electrical and Electronic Engineering Technologists and Technicians
- Engineering Technologists and Technicians
- First-Line Supervisors of Mechanics, Installers, and Repairers
- First-Line Supervisors of Production and Operating Workers
- Glaziers
- Industrial Engineering Technologists and Technicians
- Industrial Machinery Mechanics
- Industrial Production Managers
- Licensed Practical and Licensed Vocational Nurses
- Lodging Managers
- Mobile Heavy Equipment Mechanics, Except Engines
- Operating Engineers and Other Construction Equipment Operators
- Registered Nurses
- Transportation, Storage, and Distribution Managers
- Water and Wastewater Treatment Plant and System Operators

Combining the two indicators—high AI resilience and a higher proportion of workers nearing retirement—helps identify occupations that may offer the strongest long-term opportunities for program development.

As shown in Exhibit 3 in the previous section, the 17 occupations that meet both criteria—high AI resilience and at least 21% of the workforce age 55 or older—represent priority areas for apprenticeship expansion, particularly when resources are limited. Combining the two indicators helps identify occupations that may offer the strongest long-term opportunities for program development.

These findings narrow the broader list of high-wage, high-demand apprenticeable occupations to those with both sustained demand and lower risk of disruption. By prioritizing these occupations, regional partners can focus apprenticeship expansion on areas most likely to experience continued workforce demand driven by retirements while remaining less susceptible to AI-related changes. The following section of the report outlines recommendations for ways that community college educators, workforce partners, and employers can leverage the lists provided in this report.

Next Steps: How to Use the Lists in This Report

This section outlines how regional partners can use the lists in this report to support apprenticeship planning, employer engagement, and program development.

1. Diversify apprenticeships beyond the ECU sector

Use the Updated Apprenticeable Occupations list (Appendix A) to identify opportunities to develop new apprenticeship programs or expand existing ones in high-wage, high-demand occupations. This list of 78 occupations provides a foundation for expanding apprenticeships beyond the Energy, Construction, and Utilities sector, which currently dominates the regional landscape.

K–12 and community college educators may consider the following:

- Do existing programs align with these occupations, and could they support apprenticeship or pre-apprenticeship pathways?
- For occupations requiring education beyond community college, what pathways exist for students?
- How are colleges partnering with K–12 institutions to promote apprenticeship pathways?
- What barriers limit the scalability of apprenticeship programs?

2. Engage employers using retirement-driven demand

Use the list of Apprenticeable Occupations with a Retiring Workforce to support employer engagement. These occupations may face increased replacement demand due to retirements, making them particularly relevant for conversations about succession planning and talent pipelines.

While the full list identifies all high-wage, high-demand apprenticeable occupations, this subset provides a more targeted starting point for discussions about workforce needs. This approach supports more intentional apprenticeship development by aligning employer-identified needs with strategies to replace retiring workers and transfer essential knowledge.

Employers may be asked to reflect on:

- Do you anticipate worker shortages in these occupations?
- Which roles are most at risk of losing institutional knowledge as experienced workers retire?
- How could apprenticeship programs help build a pipeline of workers to fill these roles?
- How can institutional knowledge be captured and transferred through apprenticeship program design?

3. Market programs aligned with AI resilience

Use the list of Apprenticeable Occupations with High AI Resilience (see Appendix B for full ratings) to inform program development and address concerns about the impact of artificial intelligence on the workforce.

Recent research suggests that while AI will reshape many jobs, its impact will vary by occupation.[21,22] Roles involving routine administrative or analytical tasks may be more susceptible to automation or augmentation, while occupations requiring hands-on technical skills, in-person service delivery, or complex decision-making are more likely to remain resilient.

These findings can help educators and workforce partners:

1. Position apprenticeship programs in occupations less susceptible to AI disruption
2. Incorporate emerging AI-related skills where relevant
3. Respond to stakeholder concerns about long-term career stability

21 "General Artificial Intelligence and the Workforce," SHRM, The Burningglass Institute, accessed February 1, 2026, shrm-res.cloudinary.com/image/upload/v1706729099/AI/CPR-230956_Research_Gen-AI-Workplace_FINAL_1.pdf

22 "Innovation, Adoption, and the Governance of Artificial Intelligence: A Silicon Valley Perspective," October 2025, accessed February 1, 2026, bayareaeconomy.org/files/pdf/SR-AI-Report-Final-Web-October2025.pdf

4. Prioritize occupations when resources are limited

Use the High Priority Apprenticeable Occupations list to focus efforts on a smaller set of occupations that meet all key criteria: apprenticeship feasibility, high wage, high demand, a large retiring workforce, and high AI resilience.

This refined list of 17 occupations represents the strongest candidates for apprenticeship expansion based on current labor market conditions and projected workforce trends. When resources are limited, prioritizing these occupations can help maximize impact and support the development of stable, high-quality career pathways.

Conclusion

The San Diego & Imperial COE encourages regional partners, community colleges, and employers to use this report as a resource to support the development and expansion of apprenticeship programs. This report is not intended to be prescriptive. Labor market conditions change over time, and occupations that are viable today may shift due to economic or technological disruption. To examine this, the San Diego & Imperial COE also analyzed how apprenticeable occupations performed during prior economic disruptions, including the Great Recession (2007–2010) and the COVID-19 pandemic (see Appendix C). Of the 78 occupations examined, only two—Licensed Practical and Licensed Vocational Nurses and Registered Nurses—met all six criteria: high wage, high demand, apprenticeship feasibility, high AI resilience, a large retiring workforce, and resilience during both economic downturns. This finding underscores an important reality: apprenticeship programs cannot be fully future-proofed.

Instead, this report is designed to inform planning and decision-making using the best available data. Regional partners should use these findings to guide strategic decisions while recognizing that all occupations carry some level of risk. When developing or expanding apprenticeship programs, partners should consider both current labor market demand and potential future disruptions. Building flexible, responsive programs and preparing students with adaptable skills will be critical to long-term success in a changing labor market.

Appendix A: Updated Apprenticeable Occupations List

Exhibit 4. Labor Market Information for High-Wage, High-Demand Apprenticeable Occupations, San Diego County[23]

SOC Code	Occupational Title	Avg. Annual Openings 2024-2029	Entry-Level Earnings	Median Earnings	Large % of Workforce Age 55+	AI Resilience Level	Typical Entry-Level Education
Advanced Manufacturing							
51-1011	First-Line Supervisors of Production and Operating Workers	443	$28.09	$36.32	✓	High	HS or equivalent
17-3023	Electrical and Electronic Engineering Technologists and Technicians	216	$32.27	$39.74	✓	High	Associate
49-9041	Industrial Machinery Mechanics	180	$27.45	$31.91	✓	High	HS or equivalent
11-3051	Industrial Production Managers	172	$46.44	$62.68	✓	High	Bachelor's
47-2211	Sheet Metal Workers	169	$28.88	$37.52		High	HS or equivalent
17-2061	Computer Hardware Engineers	160	$63.56	$81.26		High	Bachelor's
17-3029	Engineering Technologists and Technicians, Except Drafters, All Other	146	$32.60	$43.66	✓	High	Associate
47-2221	Structural Iron and Steel Workers	83	$26.25	$36.16		High	HS or equivalent
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	70	$33.76	$38.28		High	Postsecondary non-degree
17-3026	Industrial Engineering Technologists and Technicians	66	$29.02	$37.01	✓	High	Associate
17-2011	Aerospace Engineers	58	$53.39	$63.65	✓	High	Bachelor's

23 Lightcast 2025.4; QCEW, Non-QCEW, Self-Employed.

SOC Code	Occupational Title	Avg. Annual Openings 2024-2029	Entry-Level Earnings	Median Earnings	Large % of Workforce Age 55+	AI Resilience Level	Typical Entry-Level Education
Advanced Transportation and Logistics							
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	428	$31.88	$39.52	✓	High	HS or equivalent
11-3071	Transportation, Storage, and Distribution Managers	242	$38.05	$51.92	✓	High	HS or equivalent
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	195	$28.08	$34.82		High	HS or equivalent
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	116	$28.74	$35.31	✓	High	HS or equivalent
49-2091	Avionics Technicians	75	$39.41	$43.40		High	Associate
Agriculture, Water and Environmental Technologies							
51-8031	Water and Wastewater Treatment Plant and System Operators	95	$32.26	$38.14	✓	High	HS or equivalent
19-4071	Forest and Conservation Technicians	54	$26.67	$31.26		High	Associate
Business and Entrepreneurship							
13-1199	Business Operations Specialists, All Other	1,684	$26.99	$38.76	✓	Medium	Bachelor's
43-1011	First-Line Supervisors of Office and Administrative Support Workers	1,358	$28.64	$34.70	✓	Medium	HS or equivalent
11-9199	Managers, All Other	1,333	$40.53	$69.06	✓	Medium	Bachelor's
13-2011	Accountants and Auditors	1,333	$35.24	$44.85	✓	Medium	Bachelor's
13-1111	Management Analysts	1,098	$37.00	$49.05	✓	Low	Bachelor's
13-1071	Human Resources Specialists	1,028	$29.95	$38.08		Medium	Bachelor's
13-1082	Project Management Specialists	928	$39.04	$51.73	✓	Medium	Bachelor's
13-1161	Market Research Analysts and Marketing Specialists	815	$28.18	$37.66		Low	Bachelor's

SOC Code	Occupational Title	Avg. Annual Openings 2024-2029	Entry-Level Earnings	Median Earnings	Large % of Workforce Age 55+	AI Resilience Level	Typical Entry-Level Education
43-6011	Executive Secretaries and Executive Administrative Assistants	639	$31.92	$39.69	✓	Low	HS or equivalent
11-2022	Sales Managers	638	$36.99	$59.94	✓	Medium	Bachelor's
13-1041	Compliance Officers	520	$32.74	$47.15	✓	Medium	Bachelor's
13-1028	Buyers and Purchasing Agents	515	$30.85	$38.90	✓	Medium	Bachelor's
11-2021	Marketing Managers	400	$57.36	$79.42		Medium	Bachelor's
11-3012	Administrative Services Managers	261	$40.96	$52.48	✓	Medium	Bachelor's
13-2051	Financial and Investment Analysts	242	$37.91	$49.35		Medium	Bachelor's
13-1051	Cost Estimators	235	$31.27	$40.63	✓	Medium	Bachelor's
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	183	$33.28	$51.24	✓	Medium	Bachelor's
11-2032	Public Relations Managers	54	$51.88	$67.01		Medium	Bachelor's
Education and Human Development							
21-1021	Child, Family, and School Social Workers	445	$26.16	$29.53	✓	High	Bachelor's
21-1012	Educational, Guidance, and Career Counselors and Advisors	351	$31.74	$39.67		High	Master's
Energy, Construction and Utilities							
47-2111	Electricians	983	$27.66	$35.71		High	HS or equivalent
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	357	$26.38	$34.02		High	Postsecondary non-degree
47-2073	Operating Engineers and Other Construction Equipment Operators	291	$31.32	$39.28	✓	High	HS or equivalent
47-2081	Drywall and Ceiling Tile Installers	246	$27.04	$32.98		High	None

SOC Code	Occupational Title	Avg. Annual Openings 2024-2029	Entry-Level Earnings	Median Earnings	Large % of Workforce Age 55+	AI Resilience Level	Typical Entry-Level Education
47-2051	Cement Masons and Concrete Finishers	164	$26.76	$31.80		High	None
47-4011	Construction and Building Inspectors	163	$33.56	$46.38	✓	Medium	HS or equivalent
47-2121	Glaziers	96	$27.73	$31.21	✓	High	HS or equivalent
49-2098	Security and Fire Alarm Systems Installers	87	$27.70	$34.40		High	HS or equivalent
49-9051	Electrical Power-Line Installers and Repairers	75	$36.93	$51.12		High	HS or equivalent
Health							
29-1141	Registered Nurses	1,967	$58.28	$63.85	✓	High	Bachelor's
29-2061	Licensed Practical and Licensed Vocational Nurses	682	$32.71	$37.13	✓	High	Postsecondary non-degree
29-2034	Radiologic Technologists and Technicians	126	$40.25	$51.24		High	Associate
31-9093	Medical Equipment Preparers	96	$27.72	$31.37		High	HS or equivalent
29-2055	Surgical Technologists	79	$31.57	$39.63		High	Postsecondary non-degree
ICT / Digital Media							
15-1252	Software Developers	1,327	$59.39	$76.32		Medium	Bachelor's
15-1299	Computer Occupations, All Other	653	$36.36	$57.59		Medium	Bachelor's
11-3021	Computer and Information Systems Managers	604	$74.37	$92.71		Medium	Bachelor's
15-1232	Computer User Support Specialists	376	$27.58	$33.37		Medium	Some college, no degree
15-1211	Computer Systems Analysts	329	$46.15	$54.28		Medium	Bachelor's
27-3031	Public Relations Specialists	243	$28.78	$37.26		Medium	Bachelor's
15-2051	Data Scientists	229	$39.27	$60.79		Medium	Bachelor's

SOC Code	Occupational Title	Avg. Annual Openings 2024-2029	Entry-Level Earnings	Median Earnings	Large % of Workforce Age 55+	AI Resilience Level	Typical Entry-Level Education
15-1244	Network and Computer Systems Administrators	160	$39.64	$48.91		Medium	Bachelor's
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	144	$28.50	$34.84		High	Postsecondary non-degree
15-1253	Software Quality Assurance Analysts and Testers	135	$41.09	$52.65		Medium	Bachelor's
15-1212	Information Security Analysts	132	$44.90	$62.77		High	Bachelor's
27-2012	Producers and Directors	119	$27.29	$39.59		Medium	Bachelor's
15-1251	Computer Programmers	112	$40.75	$62.25	✓	Low	Bachelor's
15-1255	Web and Digital Interface Designers	110	$33.09	$51.49		Medium	Bachelor's
49-9052	Telecommunications Line Installers and Repairers	74	$30.22	$42.26		High	HS or equivalent
15-1231	Computer Network Support Specialists	69	$30.95	$37.18		High	Associate
15-1242	Database Administrators	51	$37.63	$53.26		Medium	Bachelor's
Life Sciences / Biotech							
19-4021	Biological Technicians	264	$26.77	$29.36		High	Bachelor's
11-9121	Natural Sciences Managers	214	$77.03	$95.96	✓	Medium	Bachelor's
Public Safety							
33-3051	Police and Sheriff's Patrol Officers	598	$42.15	$52.45		High	HS or equivalent
33-2011	Firefighters	258	$27.58	$33.71		High	Postsecondary non-degree
33-3012	Correctional Officers and Jailers	243	$33.99	$41.90		High	HS or equivalent
43-5031	Public Safety Telecommunicators	90	$31.71	$37.78		Medium	HS or equivalent

SOC Code	Occupational Title	Avg. Annual Openings 2024-2029	Entry-Level Earnings	Median Earnings	Large % of Workforce Age 55+	AI Resilience Level	Typical Entry-Level Education
21-1092	Probation Officers and Correctional Treatment Specialists	88	$33.59	$44.65		High	Bachelor's
Retail, Hospitality and Tourism							
11-1021	General and Operations Managers	2,453	$62.54	$75.50	✓	Medium	Bachelor's
11-9081	Lodging Managers	85	$27.84	$35.86	✓	High	HS or equivalent

Appendix B: AI Resilience Ratings for Apprenticeable Occupations

To assess the potential impact of artificial intelligence on the 78 high-wage, high-demand apprenticeable occupations identified in this report, the San Diego & Imperial COE used findings from national studies examining occupational exposure to AI. These studies consistently show that AI is most likely to automate or augment routine cognitive tasks, such as documentation, administrative coordination, and standardized analysis, while occupations that rely on hands-on technical work, equipment operation, safety-critical decision making, or in-person services are generally less susceptible to automation:

- OpenAI & University of Pennsylvania (2023). GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models. arxiv.org/abs/2303.10130
- International Labour Organization (2025). Generative AI and Jobs: A Refined Global Index of Occupational Exposure (ILO Working Paper 140). ilo.org/publications/generative-ai-and-jobs-refined-global-index-occupational-exposure
- Brookings Institution (2024). Generative AI, the American worker, and the future of work. brookings.edu/articles/generative-ai-the-american-worker-and-the-future-of-work/
- OECD (2016). The Risk of Automation for Jobs in OECD Countries (Social, Employment and Migration Working Paper No. 189). oecd.org/els/emp/automation-and-independent-work-in-a-digital-economy-policy-brief.pdf

Using this framework, each occupation was assigned an AI resilience rating based on the occupation's primary tasks:

- High AI resilience – Occupations that primarily involve hands-on technical work, equipment operation, infrastructure maintenance, or safety-critical responsibilities that require physical execution and real-time decision making.
- Medium AI resilience – Occupations where AI may automate or augment certain tasks, but where human judgment, accountability, or interpersonal interaction remains essential.
- Low AI resilience – Occupations where a substantial share of core tasks involve routine documentation, administrative coordination, or standardized analytical work that may be more easily automated or augmented by AI.

These ratings reflect the relative exposure of occupational tasks to AI technologies rather than predictions of job loss. Most research indicates that AI will affect specific tasks within occupations rather than eliminate entire roles. The ratings are intended to help identify apprenticeable occupations that are more likely to remain stable workforce pathways as AI adoption increases. The following exhibit lists apprenticeable occupations, AI resiliency rating, and rationales from the national analyses.

Exhibit 5. AI Resilience Ratings and Implication for Apprenticeable Occupations[24]

SOC Code	Occupational Title	AI Resilience Rating	Primary AI Exposure Driver	Implication for Apprenticeship Design
13-2011	Accountants and Auditors	Medium	AI automates transaction work; audit judgment persists	Train for controls, forensic methods, regulatory judgment
11-3012	Administrative Services Managers	Medium	AI streamlines admin workflows; oversight remains	Train for vendor oversight, compliance, process redesign
17-2011	Aerospace Engineers	High	Safety-critical engineering; accountability remains	Emphasize verification, certification context, systems thinking
49-2091	Avionics Technicians	High	Safety-critical diagnostics and repair persist	Emphasize verification, documentation, compliance
19-4021	Biological Technicians	High	Lab protocols + QA + physical procedures persist	Emphasize QA, compliance, lab operations
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	High	Hands-on repair; AI augments diagnostics	Emphasize diagnostics, hybrid systems, safety
13-1199	Business Operations Specialists, All Other	Medium	Mixed coordination + exception work	Train for cross-functional problem-solving and controls
13-1028	Buyers and Purchasing Agents	Medium	AI automates comparisons; negotiation and risk persist	Train for supplier risk, contracting, compliance
47-2051	Cement Masons and Concrete Finishers	High	Manual skilled trade; difficult to automate broadly	Emphasize safety, quality craft, productivity tools
21-1021	Child, Family, and School Social Workers	High	In-person service delivery and judgment persist	Train for case management, crisis response, compliance
13-1041	Compliance Officers	Medium	AI automates monitoring; interpretation/accountability remain	Train for investigations, regulatory judgment, controls
11-3021	Computer and Information Systems Managers	Medium	AI changes IT ops; governance and accountability remain	Emphasize security governance, architecture, vendor mgmt
17-2061	Computer Hardware Engineers	High	Physical constraints and verification persist	Train for validation, test, manufacturing interface
15-1231	Computer Network Support Specialists	High	Physical network realities + troubleshooting persist	Train for troubleshooting, security hardening, field readiness

24 Lightcast 2025.4; QCEW, Non-QCEW, Self-Employed.

SOC Code	Occupational Title	AI Resilience Rating	Primary AI Exposure Driver	Implication for Apprenticeship Design
15-1299	Computer Occupations, All Other	Medium	Mixed exposure; many tasks augmented rather than removed	Prioritize roles with governance, security, integration
15-1251	Computer Programmers	Low	Routine code production compressible via GenAI	Shift apprenticeship to higher-level engineering, code review
15-1211	Computer Systems Analysts	Medium	AI assists requirements/ design; integration remains	Train for systems integration, governance, stakeholder translation
15-1232	Computer User Support Specialists	Medium	AI chat support reduces tier-1; complex support persists	Shift toward escalation, enablement, workflow integration
47-4011	Construction and Building Inspectors	Medium	AI supports documentation; field verification persists	Emphasize code interpretation + field judgment
33-3012	Correctional Officers and Jailers	High	In-person supervision and safety work persists	Train for safety protocols, de-escalation, documentation
13-1051	Cost Estimators	Medium	AI assists estimation; site/ context nuance persists	Emphasize scope validation, field verification, risk pricing
15-2051	Data Scientists	Medium	AI automates parts of modeling; problem framing persists	Train for validation, governance, domain translation
15-1242	Database Administrators	Medium	Managed services automate routine admin; governance persists	Train for security, performance, data stewardship
47-2081	Drywall and Ceiling Tile Installers	High	Manual installation in variable sites	Emphasize quality, safety, productivity methods
21-1012	Educational, Guidance, and Career Counselors and Advisors	High	Relationship work, motivation, complex barriers persist	Emphasize coaching, navigation, labor market translation
17-3023	Electrical and Electronic Engineering Technologists and Technicians	High	Hands-on testing/ instrumentation persists	Emphasize field diagnostics, safety, instrumentation
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	High	Hands-on troubleshooting persists	Emphasize diagnostics, safety, downtime response
49-9051	Electrical Power-Line Installers and Repairers	High	Safety-critical infrastructure field work persists	Emphasize safety, reliability, outage response
47-2111	Electricians	High	Field troubleshooting + code compliance persists	Emphasize diagnostics, safety, new tech integration

SOC Code	Occupational Title	AI Resilience Rating	Primary AI Exposure Driver	Implication for Apprenticeship Design
17-3029	Engineering Technologists and Technicians, Except Drafters, All Other	High	Hands-on diagnostics/ testing persists	Build skills in troubleshooting, measurement, safety
43-6011	Executive Secretaries and Executive Administrative Assistants	Low	Scheduling/drafting/ coordination highly automatable	Shift pathway toward operations support, governance, analytics
13-2051	Financial and Investment Analysts	Medium	AI accelerates modeling; accountability and client trust persists	Train for risk framing, compliance, scenario analysis
33-2011	Firefighters	High	Physical emergency response persists	Emphasize safety, incident command, teamwork
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	High	Supervises hands-on work; safety/accountability persists	Emphasize troubleshooting leadership, safety systems
43-1011	First-Line Supervisors of Office and Administrative Support Workers	Medium	AI reduces clerical volume; coordination persists	Shift to process redesign, quality control, service leadership
51-1011	First-Line Supervisors of Production and Operating Workers	High	Supervises physical operations; accountability persists	Emphasize safety leadership, quality systems, process control
19-4071	Forest and Conservation Technicians	High	Field-based work in variable environments	Train for field methods, safety, resource monitoring
11-1021	General and Operations Managers	Medium	AI accelerates reporting/ forecasting; humans remain accountable	Train for decision-making, change leadership, operational risk
47-2121	Glaziers	High	Manual installation + job site variability	Emphasize safety, precision, coordination
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	High	Field service + troubleshooting persists	Emphasize diagnostics, safety, regulations
13-1071	Human Resources Specialists	Medium	AI automates screening/ admin; employee relations persist	Train for labor relations, case management, policy application
17-3026	Industrial Engineering Technologists and Technicians	High	Physical process optimization persists	Train for lean systems, quality, automation integration
49-9041	Industrial Machinery Mechanics	High	Physical maintenance; downtime risk sustains demand	Emphasize predictive maintenance, safety, controls basics
11-3051	Industrial Production Managers	High	Physical operations + safety + real-time constraints	Train for lean, quality systems, safety leadership

SOC Code	Occupational Title	AI Resilience Rating	Primary AI Exposure Driver	Implication for Apprenticeship Design
15-1212	Information Security Analysts	High	AI increases threat velocity; defensive demand persists	Train for incident response, governance, secure AI use
29-2061	Licensed Practical and Licensed Vocational Nurses	High	Hands-on care persists; AI supports documentation	Emphasize bedside skills + care coordination tools
11-9081	Lodging Managers	High	Service operations require in-person leadership	Focus on service recovery, workforce management, compliance
13-1111	Management Analysts	Low	Core tasks (analysis/ synthesis/presentations) highly compressible	Up-skill toward implementation, change and process redesign
11-9199	Managers, All Other	Medium	Mixed exposure; AI reduces admin tasks	Emphasize accountability, managing exceptions, people leadership
13-1161	Market Research Analysts and Marketing Specialists	Low	Routine analysis/reporting and content tasks automatable	Train for experimental design, insights translation, ethics
11-2021	Marketing Managers	Medium	AI automates content/ testing; strategy and brand governance persist	Shift from production to strategy, attribution, governance
31-9093	Medical Equipment Preparers	High	Physical sterilization and compliance protocols persist	Emphasize QA, infection control, workflow reliability
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	High	Specialized repair in field conditions	Emphasize reliability, troubleshooting, preventive maintenance
11-9121	Natural Sciences Managers	Medium	AI supports research; humans lead compliance and ethics	Train for lab governance, QA, regulatory management
15-1244	Network and Computer Systems Administrators	Medium	Automation reduces routine ops; complex systems persist	Train for reliability engineering, security, automation oversight
47-2073	Operating Engineers and Other Construction Equipment Operators	High	Field constraints; automation limited by environments	Train for safety, complex operations, equipment diagnostics
33-3051	Police and Sheriff's Patrol Officers	High	Field response and discretion persist	Train for safety, legal standards, community engagement
21-1092	Probation Officers and Correctional Treatment Specialists	High	Safety + in-person supervision persists	Train for case planning, de-escalation, compliance

SOC Code	Occupational Title	AI Resilience Rating	Primary AI Exposure Driver	Implication for Apprenticeship Design
27-2012	Producers and Directors	Medium	AI supports editing/drafting; leadership persists	Train for production leadership, ethics, IP management
13-1082	Project Management Specialists	Medium	AI automates scheduling/ status; stakeholder alignment persists	Emphasize risk governance, facilitation, delivery leadership
11-2032	Public Relations Managers	Medium	AI drafts content; judgment and crisis response persist	Emphasize stakeholder strategy and risk management
27-3031	Public Relations Specialists	Medium	AI drafts content; judgment/ relationships persist	Emphasize strategy, stakeholder engagement, reputation risk
43-5031	Public Safety Telecommunicators	Medium	AI supports triage; accountability and high-stakes judgment remain	Emphasize decision protocols, situational awareness, QA
29-2034	Radiologic Technologists and Technicians	High	Imaging acquisition is hands-on; AI augments interpretation	Emphasize patient care, equipment operation, QA protocols
29-1141	Registered Nurses	High	In-person clinical care persists; AI reduces documentation	Train for clinical judgment + AI-supported documentation safely
11-2022	Sales Managers	Medium	AI optimizes pipeline and outreach; people leadership persists	Train for consultative selling systems and coaching
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Medium	AI assists outreach; technical selling persists	Emphasize consultative selling, solution design, relationships
49-2098	Security and Fire Alarm Systems Installers	High	Physical install/testing + code compliance persists	Emphasize testing, compliance, troubleshooting
47-2211	Sheet Metal Workers	High	Fabrication/installation in variable contexts	Emphasize precision, safety, reading plans
15-1252	Software Developers	Medium	AI boosts productivity; architecture/integration persists	Emphasize design, testing, security, user needs translation
15-1253	Software Quality Assurance Analysts and Testers	Medium	AI generates tests; human validation and strategy persist	Train for test strategy, risk-based QA, compliance testing
47-2221	Structural Iron and Steel Workers	High	Manual construction + safety-critical work persists	Emphasize safety, rigging, quality standards

SOC Code	Occupational Title	AI Resilience Rating	Primary AI Exposure Driver	Implication for Apprenticeship Design
29-2055	Surgical Technologists	High	In-person sterile field work persists	Emphasize sterile technique, teamwork, rapid response
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	High	Physical install/repair; site variability persists	Emphasize diagnostics, safety, customer coordination
49-9052	Telecommunications Line Installers and Repairers	High	Field infrastructure constraints persist	Emphasize safety, installation quality, testing
11-3071	Transportation, Storage, and Distribution Managers	High	Physical/logistics complexity; exception handling remains	Train for operational control, safety, disruption response
51-8031	Water and Wastewater Treatment Plant and System Operators	High	Public infrastructure operations; compliance persists	Emphasize monitoring, compliance, reliability, safety
15-1255	Web and Digital Interface Designers	Medium	AI drafts interfaces; human UX research persists	Emphasize accessibility, user research, product strategy

Appendix C: Apprenticeable Occupations in Prior Research

Exhibit 6. Summary of Workforce Indicators for Apprenticeable Occupations in San Diego County

SOC Code	Occupational Title	Priority Job[25]	High AI Resilience	Retiring Workforce (Age 55+)	Pandemic Resilient[26]	Recession Resilient[27]	DAS + DOL Approved[28]
Advanced Manufacturing							
17-2011	Aerospace Engineers		✓	✓			✓
17-2061	Computer Hardware Engineers		✓			✓	✓
17-3023	Electrical and Electronic Engineering Technologists and Technicians	✓	✓	✓		✓	✓
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	✓	✓				✓
17-3029	Engineering Technologists and Technicians, Except Drafters, All Other	✓	✓	✓	✓		✓
51-1011	First-Line Supervisors of Production and Operating Workers	✓	✓	✓			
17-3026	Industrial Engineering Technologists and Technicians	✓	✓	✓			✓
49-9041	Industrial Machinery Mechanics		✓	✓			✓
11-3051	Industrial Production Managers		✓	✓			✓
47-2211	Sheet Metal Workers	✓	✓				✓

25 "Priority Jobs and Programs: Addressing Equity Gaps for a Diverse Workforce," San Diego & Imperial COE, January 2025, accessed February 1, 2026, coeccc.net/san-diego-imperial/2024/12/priority-jobs-and-programs-addressing-equity-gaps-for-a-diverse-workforce.

26 "Resilient Jobs: Top Jobs During the Great Recession and COVID-19 Pandemic," San Diego & Imperial COE, August 2020, accessed February 1, 2026, sdiregionalconsortium.org/wp-content/uploads/2023/06/Resilient-Jobs_2020-08-27v4.pdf.

27 Ibid.

28 All apprenticeable occupations in this report were previously approved by DAS, but the occupations noted in this column were approved by both DAS and DOL. Therefore, these occupations show strong evidence for established registered apprenticeship programs. For more information, see Appendix D: Methodology. Accessed February 1, 2026, apprenticeship.gov/apprenticeship-occupations.

SOC Code	Occupational Title	Priority Job[25]	High AI Resilience	Retiring Workforce (Age 55+)	Pandemic Resilient[26]	Recession Resilient[27]	DAS + DOL Approved[28]
47-2221	Structural Iron and Steel Workers	✓	✓				✓
Advanced Transportation and Logistics							
49-2091	Avionics Technicians	✓	✓				✓
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	✓	✓				✓
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	✓	✓	✓			✓
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	✓	✓	✓			✓
11-3071	Transportation, Storage, and Distribution Managers		✓	✓			✓
Agriculture, Water and Environmental Technologies							
19-4071	Forest and Conservation Technicians		✓				✓
51-8031	Water and Wastewater Treatment Plant and System Operators	✓	✓	✓			✓
Business and Entrepreneurship							
13-2011	Accountants and Auditors			✓	✓	✓	✓
11-3012	Administrative Services Managers	✓		✓		✓	✓
13-1199	Business Operations Specialists, All Other			✓		✓	
13-1028	Buyers and Purchasing Agents	✓		✓			
13-1041	Compliance Officers			✓		✓	
13-1051	Cost Estimators	✓		✓			
43-6011	Executive Secretaries and Executive Administrative Assistants	✓		✓			

SOC Code	Occupational Title	Priority Job[25]	High AI Resilience	Retiring Workforce (Age 55+)	Pandemic Resilient[26]	Recession Resilient[27]	DAS + DOL Approved[28]
13-2051	Financial and Investment Analysts						
43-1011	First-Line Supervisors of Office and Administrative Support Workers	✓		✓	✓	✓	
13-1071	Human Resources Specialists				✓		✓
13-1111	Management Analysts			✓	✓	✓	✓
11-9199	Managers, All Other			✓	✓		✓
13-1161	Market Research Analysts and Marketing Specialists				✓	✓	✓
11-2021	Marketing Managers				✓		✓
13-1082	Project Management Specialists			✓			✓
11-2032	Public Relations Managers						
11-2022	Sales Managers			✓	✓	✓	
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products			✓		✓	✓
Education and Human Development							
21-1021	Child, Family, and School Social Workers		✓	✓			
21-1012	Educational, Guidance, and Career Counselors and Advisors		✓			✓	✓
Energy, Construction and Utilities							
47-2051	Cement Masons and Concrete Finishers		✓				✓
47-4011	Construction and Building Inspectors			✓			✓
47-2081	Drywall and Ceiling Tile Installers		✓				✓

SOC Code	Occupational Title	Priority Job[25]	High AI Resilience	Retiring Workforce (Age 55+)	Pandemic Resilient[26]	Recession Resilient[27]	DAS + DOL Approved[28]
49-9051	Electrical Power-Line Installers and Repairers	✓	✓				✓
47-2111	Electricians		✓				✓
47-2121	Glaziers		✓	✓			✓
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers		✓				✓
47-2073	Operating Engineers and Other Construction Equipment Operators	✓	✓	✓			✓
49-2098	Security and Fire Alarm Systems Installers		✓				✓
Health							
29-2061	Licensed Practical and Licensed Vocational Nurses	✓	✓	✓	✓	✓	✓
31-9093	Medical Equipment Preparers		✓				✓
29-2034	Radiologic Technologists and Technicians	✓	✓				✓
29-1141	Registered Nurses	✓	✓	✓	✓	✓	✓
29-2055	Surgical Technologists	✓	✓				✓
ICT / Digital Media							
11-3021	Computer and Information Systems Managers					✓	
15-1231	Computer Network Support Specialists	✓	✓				✓
15-1299	Computer Occupations, All Other				✓	✓	✓
15-1251	Computer Programmers			✓			✓
15-1211	Computer Systems Analysts				✓	✓	✓

SOC Code	Occupational Title	Priority Job[25]	High AI Resilience	Retiring Workforce (Age 55+)	Pandemic Resilient[26]	Recession Resilient[27]	DAS + DOL Approved[28]
15-1232	Computer User Support Specialists				✓	✓	✓
15-2051	Data Scientists						✓
15-1242	Database Administrators				✓		✓
15-1212	Information Security Analysts		✓		✓		✓
15-1244	Network and Computer Systems Administrators	✓			✓	✓	✓
27-2012	Producers and Directors						✓
27-3031	Public Relations Specialists					✓	✓
15-1252	Software Developers				✓	✓	✓
15-1253	Software Quality Assurance Analysts and Testers						✓
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	✓	✓				✓
49-9052	Telecommunications Line Installers and Repairers	✓	✓				✓
15-1255	Web and Digital Interface Designers	✓					✓
Life Sciences / Biotech							
19-4021	Biological Technicians		✓			✓	✓
11-9121	Natural Sciences Managers			✓			
Public Safety							
33-3012	Correctional Officers and Jailers	✓	✓				✓
33-2011	Firefighters	✓	✓				✓

SOC Code	Occupational Title	Priority Job[25]	High AI Resilience	Retiring Workforce (Age 55+)	Pandemic Resilient[26]	Recession Resilient[27]	DAS + DOL Approved[28]
33-3051	Police and Sheriff's Patrol Officers	✓	✓			✓	✓
21-1092	Probation Officers and Correctional Treatment Specialists		✓				
43-5031	Public Safety Telecommunicators	✓					✓
Retail, Hospitality and Tourism							
11-1021	General and Operations Managers			✓	✓	✓	✓
11-9081	Lodging Managers		✓	✓			✓

Appendix D: Methodology

To identify "apprenticeable occupations," the San Diego & Imperial COE selected occupations that have received prior approval as part of a registered apprenticeship program by the DAS. Please note that the DAS does not have an official published list of apprenticeable occupations. The DOL website includes a "search by occupation" feature that can be used to search for nationally approved occupations using common titles/aliases and O*NET codes, as well as a national list of approved registered apprenticeship occupations.[29]

In 2023, the COE downloaded a list of registered apprenticeship programs from DAS for the *Opportunities for Apprenticeships in San Diego & Imperial Counties* report, which provided the job title or occupation of the registered apprenticeship program.[30,31] Using O*NET and Lightcast, the COE mapped these job titles to a Standard Occupations Classification (SOC) code, which resulted in a final list of 273 apprenticeable occupations. Based on that list, the COE identified 138 apprenticeable occupations in San Diego County.

For this report, the San Diego & Imperial COE expanded on that initial list of 273 occupations by downloading any additional registered apprenticeship programs through November 2025 that had been approved by DAS. The COE mapped any new job titles to an SOC code, which resulted in a final count of 282 occupations. Using the "high-wage, high-demand" criteria outlined in this report, occupations met the following thresholds: (1) prior approval for a registered apprenticeship program by DAS; (2) strong projected demand between 2024 and 2029, defined as at least 50 annual job openings in San Diego County; and (3) entry-level wages at or above the county's living wage, defined as $26.01 per hour. This analysis resulted in 78 high-wage, high-demand apprenticeable occupations in San Diego County. The occupations identified in this report that were previously approved by both DAS and DOL are presented in Exhibit 6 in the Appendix, and these occupations provide strong evidence of established registered apprenticeship programs.

The San Diego & Imperial COE utilized the American Community Survey (U.S. Census Bureau) to estimate the share of the labor force comprised of workers aged 55 and older,[32] and in 2024, workers in this age group represented 21% of the labor force in San Diego County. Results revealed that 34 high-wage, high-demand apprenticeable occupations had a higher share of workers in this age group compared to the labor force. Lastly, to assess the potential impact of artificial intelligence, the San Diego & Imperial COE used findings from national studies examining occupational exposure to AI. More details about this methodology can be found in Appendix B: AI Resilience Ratings for Apprenticeable Occupations.

29 U.S. Department of Labor. Explore Approved Occupations for Registered Apprenticeship. Accessed April 1, 2026, apprenticeship.gov/apprenticeship-occupations.

30 "Opportunities for Apprenticeships in San Diego & Imperial Counties," San Diego & Imperial COE, February 2024, coeccc.net/san-diego-imperial/2024/02/opportunities-for-apprenticeships-in-san-diego-imperial-counties.

31 "Building Apprenticeship Capacity in San Diego and Imperial Counties," San Diego & Imperial COE, February 2025, coeccc.net/san-diego-imperial/2024/02/opportunities-for-apprenticeships-in-san-diego-imperial-counties.

32 U.S. Census Bureau. "Sex By Age by Employment Status for The Population 16 Years and Over, San Diego County." American Community Survey, ACS 1-Year Estimate Selected Population Detailed Tables, 2024, Table B23001, data.census.gov.

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Important Disclaimers and Limitations

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 represent data that is available and to qualify and validate the accuracy of the data; 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 report or its recommendations.