Labor Market Analysis for Program Review: 0956.00/Manufacturing and Industrial Technology (*Quality Control and Inspection*)

Orange County Center of Excellence, October 2024

Program reviews are conducted by individual colleges to periodically review curriculum of their existing programs, and in the case of career technical education programs, ensure continued alignment with regional labor market needs. Because a program review evaluates an existing program, rather than establishing a new program, additional supply will not be added; therefore, the endorsement criteria included in this report is determined slightly differently than it is for a new program that requires regional recommendation.

Summary

Program LMI Endorsement	Endorsed: All LMI Criteria Met	☐	Endorsed: Some LMI Criteria Met	☒	Not LMI Endorsed	☐

Program LMI Endorsement Criteria		
Supply Gap:	Yes ☑	No ☐
	Comments: there is projected to be **2,692 annual job openings** throughout Los Angeles and Orange counties for these quality control occupations, which **is more than the 621 awards conferred by educational institutions.**	
Self-Sufficiency Standard Living Wage[1]:	Yes ☐	No ☑
	Comments: **the majority (93%) of annual job openings** for these quality control occupations **have entry-level hourly wages below the OC living wage of $27.13.**	
Education:	Yes ☑	No ☐
	Comments: though one of these quality control occupations typically requires a high school diploma or equivalent and the other typically requires an associate degree, **between 37% and 51% of workers in the field have completed some college or an associate degree as their highest level of education.**	
Additional Considerations		
Emerging Occupation(s):	Yes ☐	No ☑
	Comments: N/A	
OC Resilient Job(s):	Yes ☐	No ☑
	Comments: See Resilient Jobs and US News & World Report Best Jobs	
U.S. News & World Report 2024 Best Jobs List[2]:	Yes ☐	No ☑
	Comments: See Resilient Jobs and US News & World Report Best Jobs	

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[1] At the direction of the California Community College Chancellor's Office, the living wage endorsement criteria in this report uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard, which the COE refers to as a living wage, to determine Orange County's living wage of $27.13, last updated in March 2024.
[2] "100 Best Jobs of 2024," U.S. News & World Report, accessed May 7, 2024, https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs.

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to determine whether there is a supply gap in the Los Angeles/Orange County regional labor market related to two middle-skill occupations:

- *Industrial Engineering Technologists and Technicians (17-3026)*
- *Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)*

Based on the available data there appears to be a supply gap for these quality control occupations and typical education requirements for these occupations align with a community college education. However, the majority of annual job openings have entry-level wages below the Self-Sufficiency Standard living wage. **Therefore, due to some of the regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for the occupations included in this report.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Industrial Engineering Technologists and Technicians (17-3026)	LA: 81 OC: 61 *TTL: 142*	LA: 474 OC: 103 *TTL: 577*	OC: $28.78	Associate degree	51%
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	LA: 1,681 OC: 870 *TTL: 2,550*	LA: 44 OC: 0 *TTL: 44*	OC: $18.88	High school diploma or equivalent	37%
Total	**2,692**	**621**	**N/A**	**N/A**	**N/A**

Demand:

- The number of jobs related to these quality control occupations is projected to decrease 2% through 2028, equating to 2,692 annual job openings due to retirements and replacements.
- Hourly entry-level wages for these quality control occupations range from $18.88 to $28.78 in Orange County; 93% of annual job openings have entry-level wages below the Self-Sufficiency Standard living wage.
- There were 8,328 online job postings for these quality control occupations over the past 12 months. The highest number of postings were for quality control inspectors, quality inspectors, and quality control technicians.
- The typical entry-level education for these quality control occupations ranges from a high school diploma or equivalent to an associate degree.
- Between 37% and 51% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Supply:

- There was an average of 539 awards conferred by 17 community colleges in Los Angeles and Orange Counties from 2020 to 2023.
- Non-community college institutions conferred an average of 82 awards from 2019 to 2022.
- Orange County community college students that exited manufacturing and industrial technology programs in the 2020-21 academic year had a median annual wage of $44,864 ($21.57 per hour) after exiting the program and 52% attained the regional living wage.
- Throughout Orange County, 76% of manufacturing and industrial technology students that exited their program in 2019-20 reported that they are working in a job closely related to their field of study.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for these quality control occupations from 2018 through 2028. Employment in these quality control occupations decreased 8% from 2019 to 2020 in Orange County due to the COVID-19 pandemic, similar to the 7% decline across all occupations during the same period.

In the two years preceding the pandemic, employment for these occupations steadily increased in Orange County, with a 3% increase in 2018 and 2019. After a decrease in employment in 2020 and an increase through 2023, employment for these two occupations in Orange County is projected to remain flat through 2028, experiencing a lower rate relative to all occupations in Los Angeles and Orange counties.

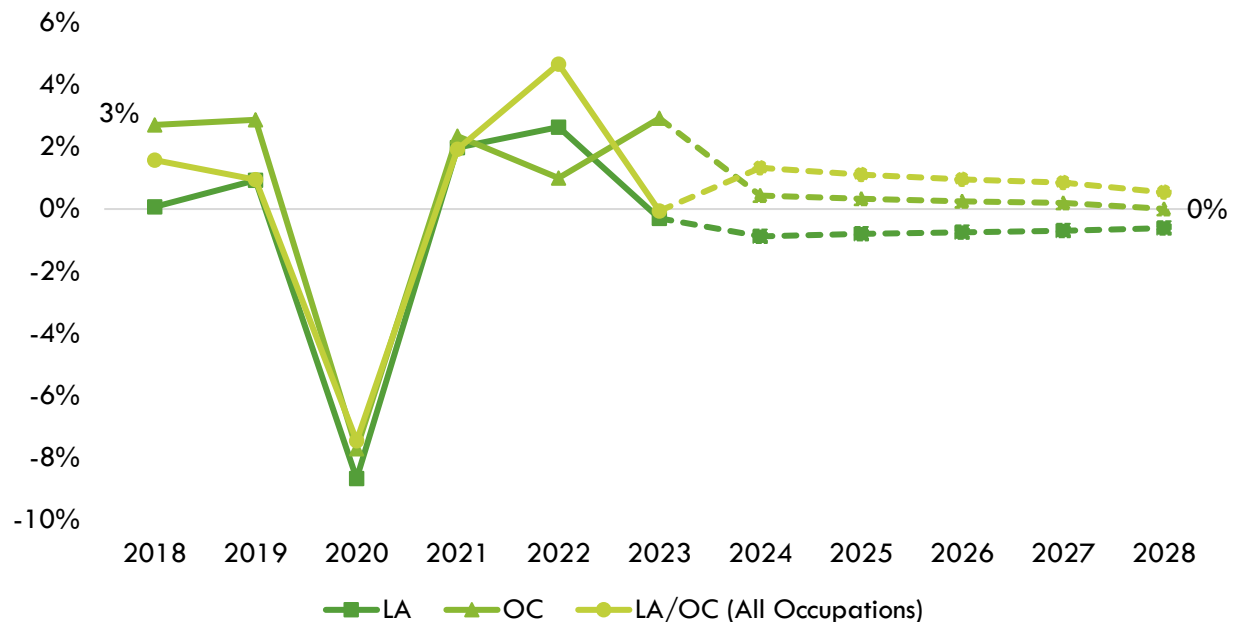### Exhibit 2: Annual Percent Change in Jobs for Quality Control Occupations, 2018-2028

Exhibit 3 shows the five-year occupational demand projections for these quality control occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 2% through 2028. There is projected to be 2,692 jobs available annually.

Exhibit 3: Occupational Demand in Los Angeles and Orange Counties[3]

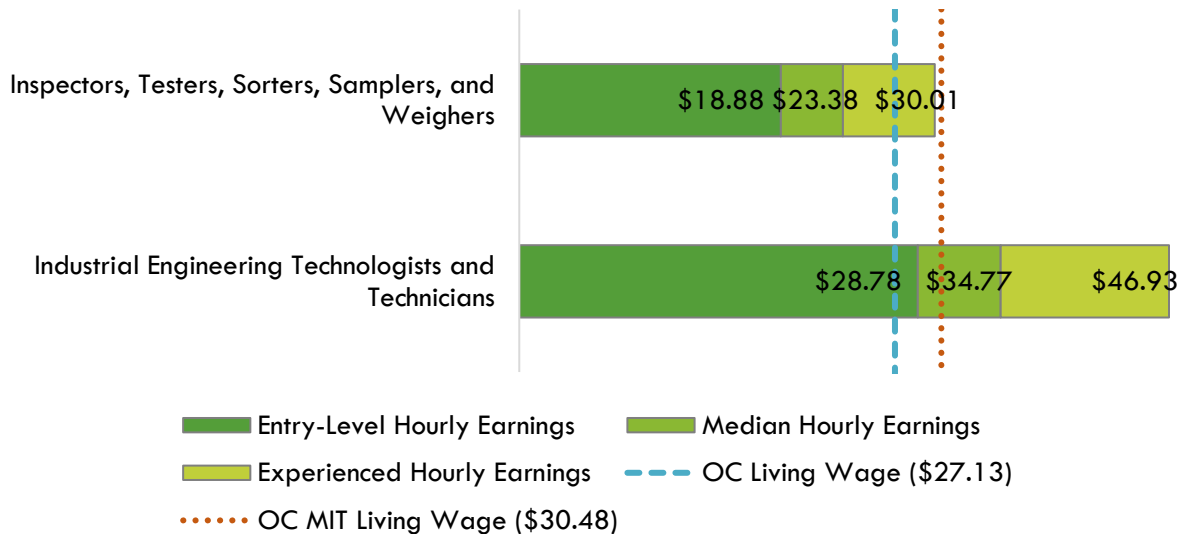| Geography	2023 Jobs	2028 Jobs	2023-2028 Change	2023-2028 % Change	Annual Openings
Los Angeles	15,870	15,285	(585)	(4%)	1,762
Orange	8,036	8,134	98	1%	931
Total	**23,905**	**23,418**	**(487)**	**(2%)**	**2,692**

Wages:

The labor market endorsement in this report considers the entry-level hourly wages for these quality control occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below to provide a complete analysis of the LA/OC region.

At the direction of the California Community College Chancellor's Office, the living wage endorsement criteria in this report uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard, which the COE refers to as a living wage, to determine Orange County's living wage of $27.13, last updated in March 2024. Additionally, data for the MIT Living Wage, updated on February 14, 2024, is provided as a reference. Currently, the MIT Living Wage in Orange County is $30.48. Both figures, which account for geographic-specific costs of necessities such as housing, food, health care, and transportation to assess the cost of living, are notated in the exhibits below.

The majority (93%) of annual openings for these quality control occupations have entry-level wages below the Self-Sufficiency Standard living wage for one adult ($27.13 in Orange County). Typical entry-level hourly wages range between $18.88 and $28.78. Orange County's average wages of $27.53 are above the average statewide wage of $27.32 for these occupations. Exhibit 4 shows the wage range for each of these quality control occupations in Orange County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 4: Wages by Occupation in Orange County

Inspectors, Testers, Sorters, Samplers, and Weighers — $18.88 $23.38 $30.01

Industrial Engineering Technologists and Technicians — $28.78 $34.77 $46.93

- Entry-Level Hourly Earnings
- Median Hourly Earnings
- Experienced Hourly Earnings
- OC Living Wage ($27.13)
- OC MIT Living Wage ($30.48)

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[3] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

The majority (95%) of annual openings for these quality control occupations have entry-level wages below the Self-Sufficiency Standard living wage for one adult ($24.03 in Los Angeles County). Typical entry-level hourly wages range between $18.35 and $27.03. Los Angeles County's average wages of $26.62 are below the average statewide wage of $27.32 for these occupations. Exhibit 5 shows the wage range for each of these quality control occupations in Los Angeles County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.
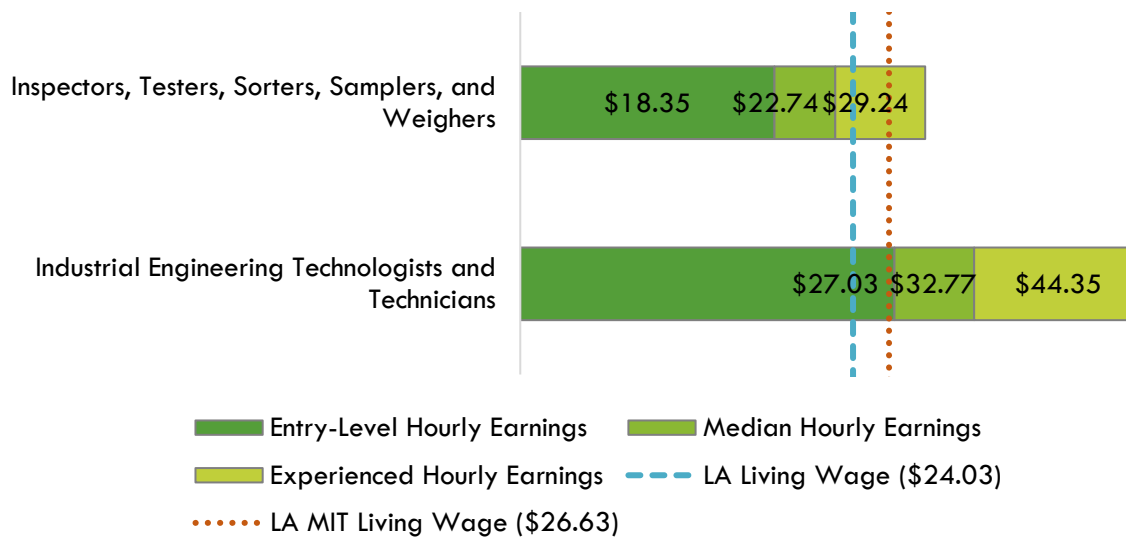
Exhibit 5: Wages by Occupation in Los Angeles County

Inspectors, Testers, Sorters, Samplers, and Weighers: $18.35 $22.74 $29.24

Industrial Engineering Technologists and Technicians: $27.03 $32.77 $44.35

Legend:
- Entry-Level Hourly Earnings
- Median Hourly Earnings
- Experienced Hourly Earnings
- LA Living Wage ($24.03)
- LA MIT Living Wage ($26.63)

Resilient Jobs and U.S. News & World Report Best Jobs:

Exhibit 6 shows if each occupation is considered an Orange County Great Recession-Resilient, COVID-19 Pandemic Recession-Resilient Job, or a 2024 U.S. News & World Report (USN&WR) Best Job. Neither of the two quality control occupations met the criteria to be consider any of the three designations.

Exhibit 6: Resilient Jobs and USN&WR Best Jobs Designations

Occupation	Great Recession-Resilient Job	COVID-19 Pandemic Recession-Resilient Job	2024 USN&WR Best Job
Industrial Engineering Technologists and Technicians	☐	☐	☐
Inspectors, Testers, Sorters, Samplers, and Weighers	☐	☐	☐

Job Postings:

Important Online Job Postings Data Note: Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.[4] For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast's database.

Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

There were 8,328 online job postings related to these quality control occupations listed in the past 12 months. Exhibit 7 shows the number of job postings by occupation. Nearly 83% of job postings were for *inspectors, testers, sorters, samplers, and weighers*, followed distantly by the 17% that were for *industrial engineering technologists and technicians*.

Exhibit 7: Number of Job Postings by Occupation (n=8,328)

Occupation	Job Postings	Percentage of Job Postings
Inspectors, Testers, Sorters, Samplers, and Weighers	6,893	83%
Industrial Engineering Technologists and Technicians	1,435	17%
Total Postings	**16,527**	**100%**

The top employers in the region, by number of job postings, are shown in Exhibit 8.

Exhibit 8: Top Employers by Number of Job Postings (n=8,328)

Employer	Job Postings	Percentage of Job Postings
Aerotek	441	5%
Actalent	184	2%
Volt	121	1%
Express Employment Professionals	79	1%
Kelly Services	77	1%
Adecco	69	1%
Key Skilled Personnel	69	1%
ManpowerGroup	59	1%
Randstad	58	1%
Flag Solutions	55	1%

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[4] K. R. Chowdhary, Fundamentals of Artificial Intelligence (Basingstoke: Springer Nature, 2020), https://link.springer.com/book/10.1007/978-81-322-3972-7.

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 9.
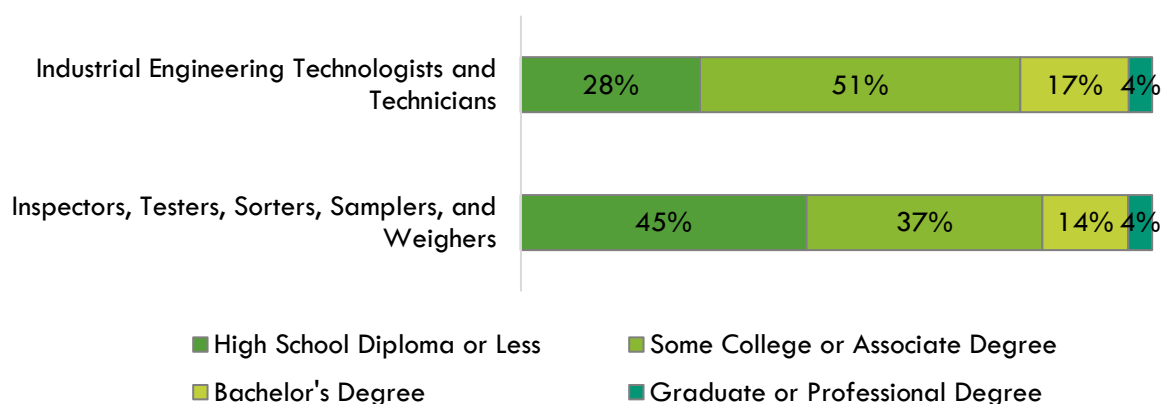
Exhibit 9: Top Skills by Number of Job Postings (n=8,328)

Top Specialized Skills	Top Soft Skills	Top Computer Skills
Auditing (1,915)	Quality Control (2,811)	Microsoft Excel (1,293)
Calipers (1,663)	Communication (2,578)	Microsoft Office (889)
Micrometer (1,617)	Quality Assurance (2,216)	Microsoft Outlook (617)
Good Manufacturing Practices (1,149)	Detail Oriented (2,052)	Microsoft Word (573)
Quality Management (986)	Management (1,725)	Microsoft PowerPoint (465)
Coordinate Measuring Machine (CMM) (933)	Operations (1,520)	SAP Applications (234)
Quality Management Systems (928)	Computer Literacy (1,309)	Spreadsheets (184)
Machining (815)	Safety Assurance (1,308)	Microsoft Access (126)
First Article Inspections (735)	Microsoft Excel (1,293)	Operating Systems (76)
Aerospace Basic Quality System Standards (713)	Problem Solving (1,188)	Laboratory Information Management Systems (71)

Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education for *inspectors, testers, sorters, samplers, and weighers* and an associate degree for *industrial engineering technologists and technicians*. The national-level educational attainment data indicates between 37% and 51% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 10 shows the educational attainment for each occupation, sorted by highest community college educational attainment to lowest.

Exhibit 10: National-level Educational Attainment for Occupations

	High School Diploma or Less	Some College or Associate Degree	Bachelor's Degree	Graduate or Professional Degree
Industrial Engineering Technologists and Technicians	28%	51%	17%	4%
Inspectors, Testers, Sorters, Samplers, and Weighers	45%	37%	14%	4%

- High School Diploma or Less
- Some College or Associate Degree
- Bachelor's Degree
- Graduate or Professional Degree

Of the 58% of the cumulative job postings for these quality control occupations that listed a minimum education requirement in Los Angeles/Orange County, 78% (3,771) requested a high school diploma or an associate degree and 21% (1,010) requested a bachelor's degree.

Educational Supply

Community College Supply:

Exhibit 11 shows the three-year average number of awards conferred by community colleges in the related TOP codes:

- Engineering Technology, General (requires Trigonometry) (0924.00)
- Industrial Electronics (0934.20)
- Manufacturing and Industrial Technology (0956.00)

- Industrial and Occupational Safety and Health (17-3026)
- Other Engineering and Related Industrial Technologies (0999.00)

No awards were conferred for the following related TOP code: Industrial Quality Control (0956.80).

The colleges with the most completions in the region are Pasadena, LA Southwest, and Coastline. Over the past 12 months, there was one related program recommendation requests from regional community colleges.
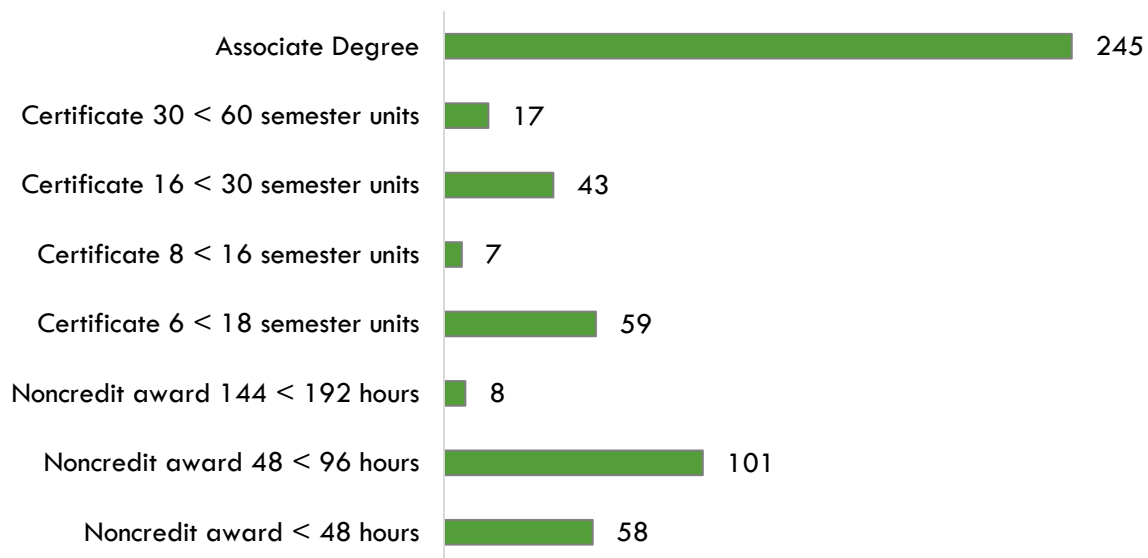
Exhibit 11: Regional Community College Awards (Certificates and Degrees), 2020-2023

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
0924.00	Engineering Technology, General (requires Trigonometry)	Cerritos	6	15	9	10
		East LA	1	0	0	0
		Glendale	14	3	2	6
		Mt San Antonio	0	6	25	10
		Pasadena	238	211	198	216
		LA Subtotal	**259**	**235**	**234**	**243**
		Santa Ana	5	0	0	2
		OC Subtotal	**5**	**0**	**0**	**2**
		Supply Subtotal/Average	**264**	**235**	**234**	**244**
0934.20	Industrial Electronics	LA Valley	23	0	0	8
		LA Subtotal	**23**	**0**	**0**	**8**
		Orange Coast	0	0	1	0
		OC Subtotal	**0**	**0**	**1**	**0**
		Supply Subtotal/Average	**23**	**0**	**1**	**8**
0956.00	Manufacturing and Industrial Technology	Cerritos	1	1	1	1
		El Camino	0	4	2	2
		Glendale	0	1	0	0
		LA Trade	9	15	3	9
		LA Valley	7	0	2	3
		Mt San Antonio	4	13	26	14
		LA Subtotal	**21**	**34**	**34**	**30**

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Fullerton	20	18	9	16
		Irvine	4	2	0	2
		Saddleback	4	8	4	5
		Santa Ana	2	4	0	2
		Santiago Canyon	12	7	6	8
		OC Subtotal	**42**	**39**	**19**	**33**
		Supply Subtotal/Average	**63**	**73**	**53**	**63**
0956.70	Industrial and Occupational Safety and Health	LA Southwest	0	117	309	142
		LA Trade	5	5	4	5
		LA Subtotal	**5**	**122**	**313**	**147**
		-	-	-	-	-
		OC Subtotal	**-**	**-**	**-**	**-**
		Supply Subtotal/Average	**5**	**122**	**313**	**147**
0999.00	Other Engineering and Related Industrial Technologies	Santa Monica	0	4	24	9
		LA Subtotal	**0**	**4**	**24**	**9**
		Coastline	42	21	139	67
		OC Subtotal	**42**	**21**	**139**	**67**
		Supply Subtotal/Average	**42**	**25**	**163**	**77**
		Supply Total/Average	**397**	**455**	**764**	**539**

Exhibit 12 shows the annual average community college awards by type from 2020-21 to 2022-23. The majority of awards are for associate degrees, followed distantly by noncredit awards between 48 and less than 96 hours and certificates between 6 and less than 18 semester units.

Exhibit 12: Annual Average Community College Awards by Type, 2020-2023

Award Type	Value
Associate Degree	245
Certificate 30 < 60 semester units	17
Certificate 16 < 30 semester units	43
Certificate 8 < 16 semester units	7
Certificate 6 < 18 semester units	59
Noncredit award 144 < 192 hours	8
Noncredit award 48 < 96 hours	101
Noncredit award < 48 hours	58

Community College Student Outcomes:

Exhibit 13 shows the Strong Workforce Program (SWP) metrics for manufacturing and industrial technology programs in Rancho Santiago Community College District (RSCCD), the Orange County Region, and California. Of the 438 Orange County manufacturing and industrial technology students in the 2020-21 academic year, 12% (52) attended an RSCCD college.

Additionally, RSCCD students that exited manufacturing and industrial technology programs in the 2021-22 academic year had higher median annual earnings ($58,070 or $27.92 per hour) compared to all manufacturing and industrial technology students in Orange County ($44,864 or $21.57 per hour). A higher percentage of RSCCD manufacturing and industrial technology students attained the living wage (58%) when compared to all manufacturing and industrial technology students in Orange County (52%).

Exhibit 13: Manufacturing and Industrial Technology (0956.00) Strong Workforce Program Metrics, 2021-22[5]

SWP Metric	RSCCD	OC Region	California
SWP Students	52	438	3,670
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	42%	40%	31%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	93%	93%	14%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	Insufficient Data	30	386
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2019-20)	Insufficient Data	25	96
SWP Students with a Job Closely Related to Their Field of Study (2019-20)	67%	76%	79%
Median Annual Earnings for SWP Exiting Students (2020-21)	$58,070 ($27.92)	$44,864 ($21.57)	$47,028 ($22.61)
Median Change in Earnings for SWP Exiting Students (2020-21)	3%	4%	31%
SWP Exiting Students Who Attained the Living Wage (2020-21)	58%	52%	67%

Non-Community College Supply:

To comprehensively analyze the regional supply, it is crucial to include data from other institutions offering quality control training programs. Exhibit 14 displays the annual and three-year average awards granted by these institutions under the related Classification of Instructional Programs (CIP) codes:

- Industrial Technology/Technician (15.0612)
- Manufacturing Engineering Technology/Technician (15.0613)
- Quality Control Technology/Technician (15.0702)

No awards were conferred under the following related CIP codes:

- Applied Engineering Technologies/Technicians (15.0001)
- Industrial Safety Technology/Technician (15.0703)

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[5] All SWP metrics are for 2021-22 unless otherwise noted.

- Process Safety Technology/Technician (15.0705)
- Industrial Production Technologies/Technicians, Other (15.0699)

The available data covers 2019 to 2022. During this period, non-community college institutions in the region conferred an average of 82 awards annually in related programs.

Exhibit 14: Regional Non-Community College Awards, 2019-2022

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
15.0612	Industrial Technology / Technician	California State University-Los Angeles	48	31	35	38
		Supply Subtotal/Average	48	31	35	38
15.0613	Manufacturing Engineering Technology / Technician	California State University-Long Beach	0	0	0	0
		Supply Subtotal/Average				
15.0702	Quality Control Technology / Technician	California Intercontinental University	0	0	0	0
		California State University-Dominguez Hills	51	40	41	44
		California State University-Northridge	0	0	0	0
		Supply Subtotal/Average	51	40	41	44
		Supply Total/Average	99	71	76	82

Regional Demographics

This section examines demographic data for Orange County community college students in manufacturing and industrial technology programs compared to the OC population, along with occupational data, to identify potential diversity and equity issues addressable by community college programs.
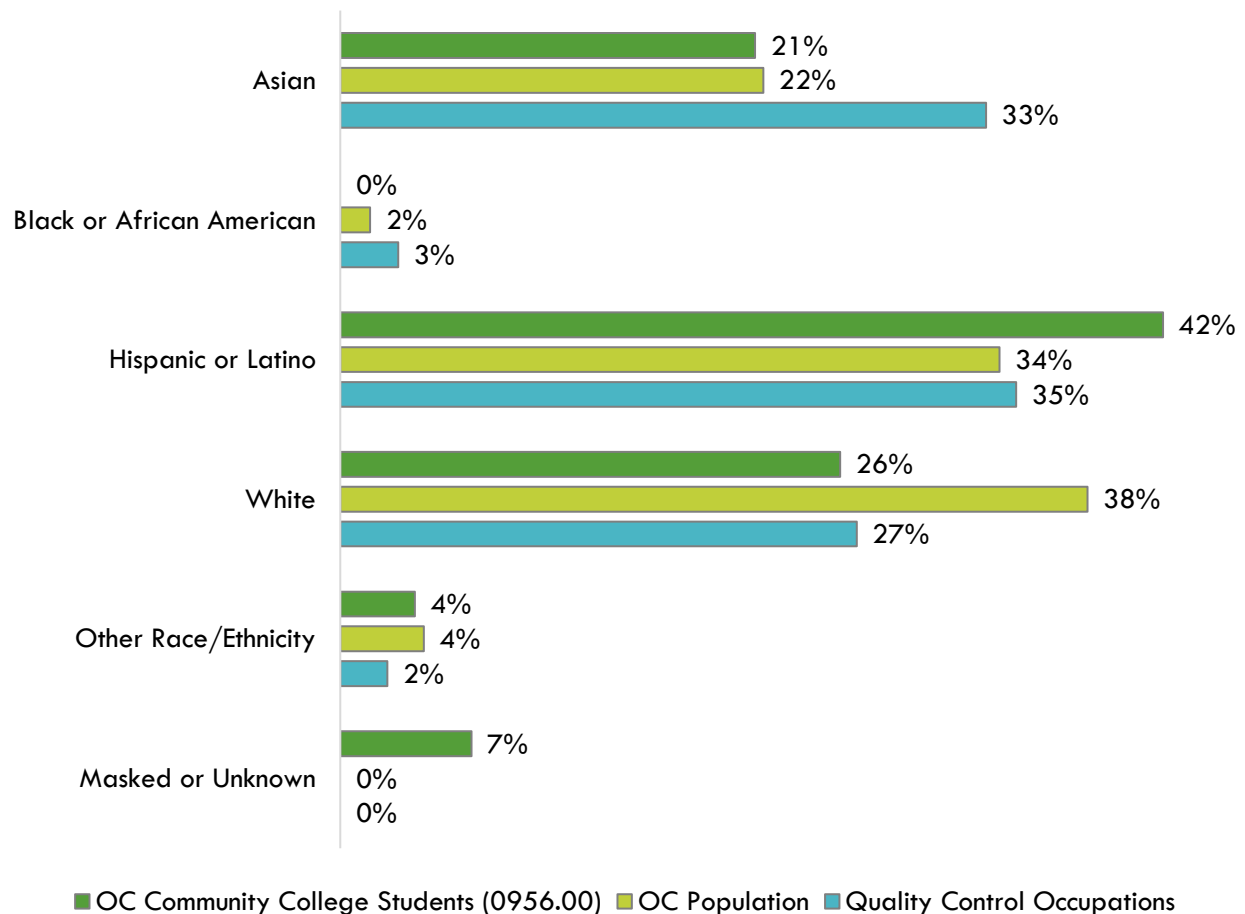
Ethnicity:

Exhibit 15 compares the ethnicity of Orange County community college students enrolled in manufacturing and industrial technology programs, the overall Orange County population, and occupation-specific data for the two quality control occupations included in this report.

Notably, 33% of workers employed in these quality control occupations are Asian, which is higher than the population (22%) and community college manufacturing and industrial technology students (21%).

Examining disaggregated data for each occupation (not shown), Asian individuals account for the plurality of *industrial engineering technologists and technicians* (39%). Hispanic and Latino individuals comprise the plurality of *inspectors, testers, sorters, samplers, and weighers* (40%). This occupation has the lowest entry-level wages and education requirements of the two quality control occupations.

Exhibit 15: Program and County Demographics by Ethnicity

Asian
- OC Community College Students (0956.00): 21%
- OC Population: 22%
- Quality Control Occupations: 33%

Black or African American
- OC Community College Students (0956.00): 0%
- OC Population: 2%
- Quality Control Occupations: 3%

Hispanic or Latino
- OC Community College Students (0956.00): 42%
- OC Population: 34%
- Quality Control Occupations: 35%

White
- OC Community College Students (0956.00): 26%
- OC Population: 38%
- Quality Control Occupations: 27%

Other Race/Ethnicity
- OC Community College Students (0956.00): 4%
- OC Population: 4%
- Quality Control Occupations: 2%

Masked or Unknown
- OC Community College Students (0956.00): 7%
- OC Population: 0%
- Quality Control Occupations: 0%

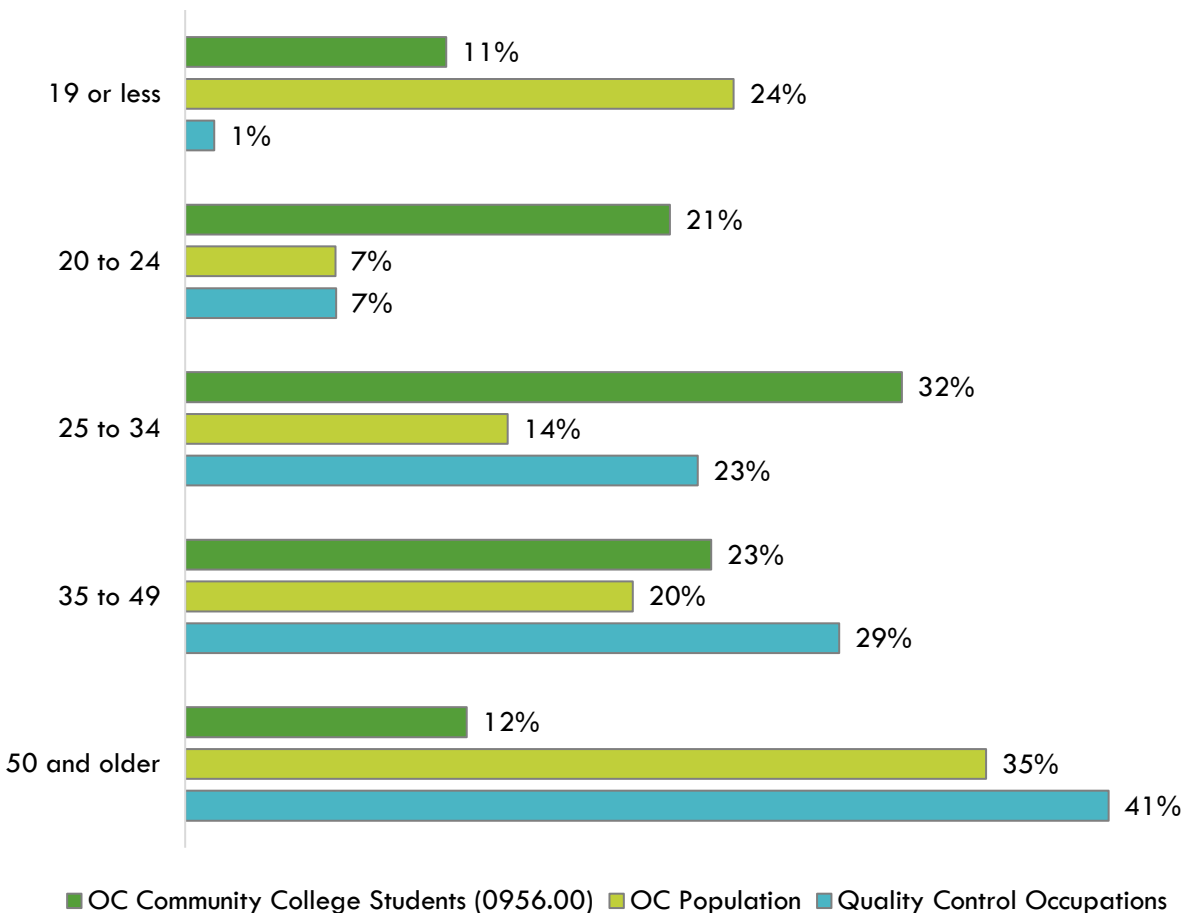Legend: ■ OC Community College Students (0956.00) ■ OC Population ■ Quality Control Occupations

Age:

Exhibit 16 compares the age of Orange County community college students enrolled in manufacturing and industrial technology programs, the overall Orange County population, and occupation-specific data for the two quality control occupations included in this report.

Nearly 41% of workers in these quality control occupations are age 50 and older, which is higher than the population (35%) and significantly higher than community college manufacturing and industrial technology students (12%).

Examining disaggregated data for each occupation (not shown), 41% of workers for both occupations are 50 and older. The occupation with the highest percentage of workers 34 or younger is *inspectors, testers, sorters, samplers, and weighers* (31%), which has the lowest entry-level wages and education requirements of the two quality control occupations.

Exhibit 16: Program and County Demographics by Age

19 or less
- 11%
- 24%
- 1%

20 to 24
- 21%
- 7%
- 7%

25 to 34
- 32%
- 14%
- 23%

35 to 49
- 23%
- 20%
- 29%

50 and older
- 12%
- 35%
- 41%

■ OC Community College Students (0956.00) ■ OC Population ■ Quality Control Occupations
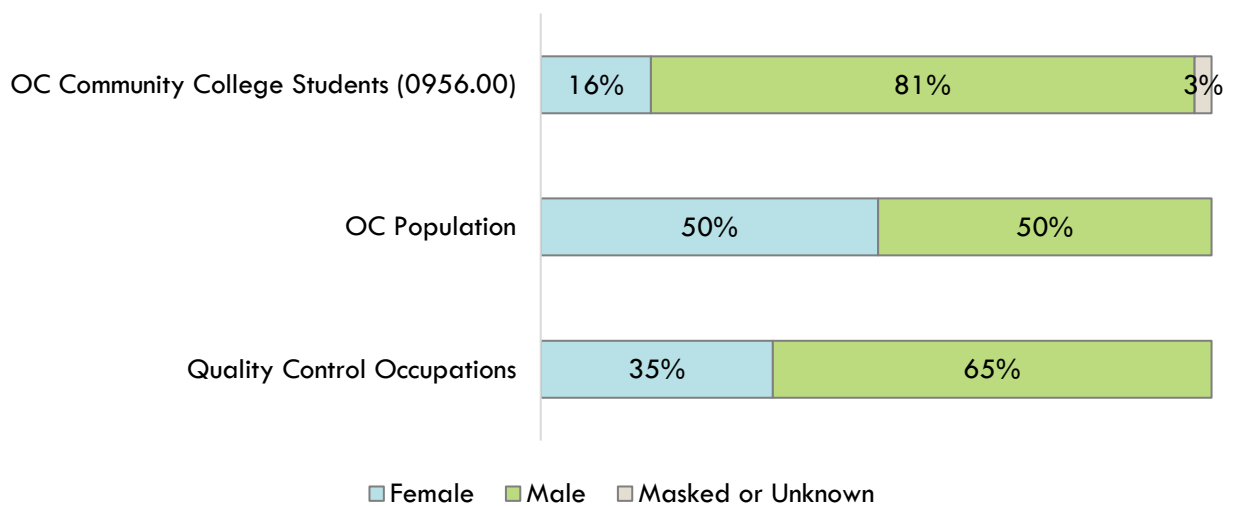
Sex:

Exhibit 17 compares the sex of Orange County community college students enrolled in manufacturing and industrial technology programs, the overall Orange County population, and occupation-specific data for these quality control occupations.

Though the population is split evenly between women and men, 16% of community college manufacturing and industrial technology students and 35% of workers in these two quality control occupations are women.

Examining disaggregated data for each occupation (not shown), men account for the majority of workers in each occupation: *industrial engineering technologists and technicians* (81%) and *inspectors, testers, sorters, samplers, and weighers* (58%). The occupation with the highest percentage of women is *inspectors, testers, sorters, samplers, and weighers* (42%), which has the lowest entry-level wages and education requirements of the two quality control occupations.

Exhibit 17: Program and County Demographics by Sex

	Female	Male	Masked or Unknown
OC Community College Students (0956.00)	16%	81%	3%
OC Population	50%	50%	
Quality Control Occupations	35%	65%	

☐ Female   ☐ Male   ☐ Masked or Unknown

Appendix A: Methodology

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a "supply table" with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/
Living Wage	"Living Wage" measures the income necessary for an individual or family to afford basic expenses by assessing the costs such as housing, food, child care, health care, transportation, and taxes. Per the CCCCCO's this report's endorsement criteria uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard last updated in March 2024, which is $27.13 per hour ($56,451 annually) in Orange County. For more information, see: http://www.selfsufficiencystandard.org/California The MIT Living Wage, updated on February 14, 2024, is a nationally recognized living wage metric and is provided for reference. The current MIT Living Wage in Orange County is $30.48. For more information, see: https://livingwage.mit.edu/counties/06059
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/
Educational Supply	The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions
Student Metrics and Demographics	LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx

Data Type	Source
Population and Occupation Demographics	The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml

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