Labor Market Analysis for Program Recommendation: 0707.00/Computer Software Development *(Certificate in C# Programming)* *(Certificate in Visual Basic .Net Programming)*

Orange County Center of Excellence, September 2024

FOR LABOR MARKET RESEARCH
ORANGE COUNTY

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 **1,049 middle-skill annual job openings** throughout Los Angeles and Orange counties for these middle-skill programming occupations, which **is less than the 1,705 awards conferred by educational institutions.** However, these educational programs also prepare students for 56 other related occupations, **which account for 63,902 additional annual job openings.** ***Because these programs train for a variety of occupations with high demand, there is most likely an undersupply of labor for these programming occupations.***
CA Insight Living Wage: (Entry-Level, 25th)[1]	Yes ☑	No ☐
	Comments: **all annual job openings** for these middle-skill programming occupations **have entry-level hourly wages above the OC living wage of $20.63.**
Education:	Yes ☑	No ☐
	Comments: though all annual job openings for these middle-skill programming occupations typically require a bachelor's degree, **nearly 25% 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	

[1] The living wage endorsement criteria in this report uses the California Insight Center's living wage of $20.63 for Orange County, last updated in September 2021, as currently employed by the Chancellor's Office for the *Students Who Attained the Living Wage Strong Workforce Program* metric.

[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 four programming occupations:

- Middle-Skill
  - *Web Developers (15-1254)*
  - *Web and Digital Interface Designers (15-1255)*
- Above Middle-Skill – denoted with a caret (^) throughout this report.
  - *Computer Programmers (15-1251)^*
  - *Software Developers (15-1252)^*

Based on the available data, there appears to be a supply gap for these middle-skill programming occupations. Though the number of awards for these occupations exceeds demand, supply is overstated because the related educational programs train for an additional 56 occupations. When considering the high demand for all 58 occupations, there is most likely an undersupply of labor for the two middle-skill programming occupations. In addition, typical education requirements for these occupations align with a community college education and typical entry-level wages are above the California Insight living wage. **Therefore, due to all 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
Web Developers (15-1254)	LA: 223 OC: 80 TTL: 303	*Accounted for Below*	OC: $26.11	Bachelor's degree	25%
Web and Digital Interface Designers (15-1255)	LA: 566 OC: 181 TTL: 747	LA: 1,237 OC: 468 TTL: 1,705	OC: $30.01	Bachelor's degree	25%
Middle-Skill Total	**1,049**	**1,705**	**N/A**	**N/A**	**N/A**
Computer Programmers (15-1251)^	LA: 279 OC: 127 TTL: 406	LA: 73 OC: 72 TTL: 145	OC: $35.74	Bachelor's degree	20%
Software Developers (15-1252)^	LA: 3,062 OC: 1,384 TTL: 4,445	LA: 4,702 OC: 2,191 TTL: 6,893	OC: $57.29	Bachelor's degree	12%
Above Middle-Skill Total	**4,852**	**7,038**	**N/A**	**N/A**	**N/A**
Total	**5,901**	**8,743**	**N/A**	**N/A**	**N/A**

Demand:

- The number of jobs related to these middle-skill programming occupations are projected to increase 6% through 2028, equating to 1,049 annual job openings.
- Hourly entry-level wages for these middle-skill programming occupations range from $26.11 to $30.01 in Orange County; all annual job openings have entry-level wages above the California Insight living wage.
- There were 3,759 online job postings for these middle-skill programming occupations over the past 12 months. The highest number of postings were for UI/UX designers, web developers, and UX designers.
- The typical entry-level education for these middle-skill programming occupations is a bachelor's degree.
- Nearly 25% of workers in these middle-skill occupations have completed some college or an associate degree as their highest level of educational attainment.

Supply:

- There was an average of 936 awards conferred by 28 community colleges in Los Angeles and Orange Counties from 2020 to 2023.
- Non-community college institutions conferred an average of 769 awards from 2019 to 2022.
- Orange County community college students that exited computer software development programs in the 2020-21 academic year had a median annual wage of $44,208 ($21.25 per hour) after exiting the program and 50% attained the regional living wage (California Insight).
- Throughout Orange County, 57% of computer software development 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 all four programming occupations researched in this report from 2018 through 2028. Though employment across all occupations in Los Angeles and Orange counties decrease 7% from 2019 to 2020 due to the COVID-19 pandemic, employment in these programming occupations increased 1% in Orange County during the same period.

In the two years preceding the pandemic, employment for these programming occupations increased in Orange County, with a 4% increase in 2019 following a 2% increase in 2018. After a small increase in employment in 2020 and a 3% increase through 2023, employment for these four occupations in Orange County is projected to increase 1% through 2028, experiencing a similar rate relative to all occupations in Los Angeles and Orange counties.

Exhibit 2: Annual Percent Change in Jobs for Programming Occupations, 2018-2028

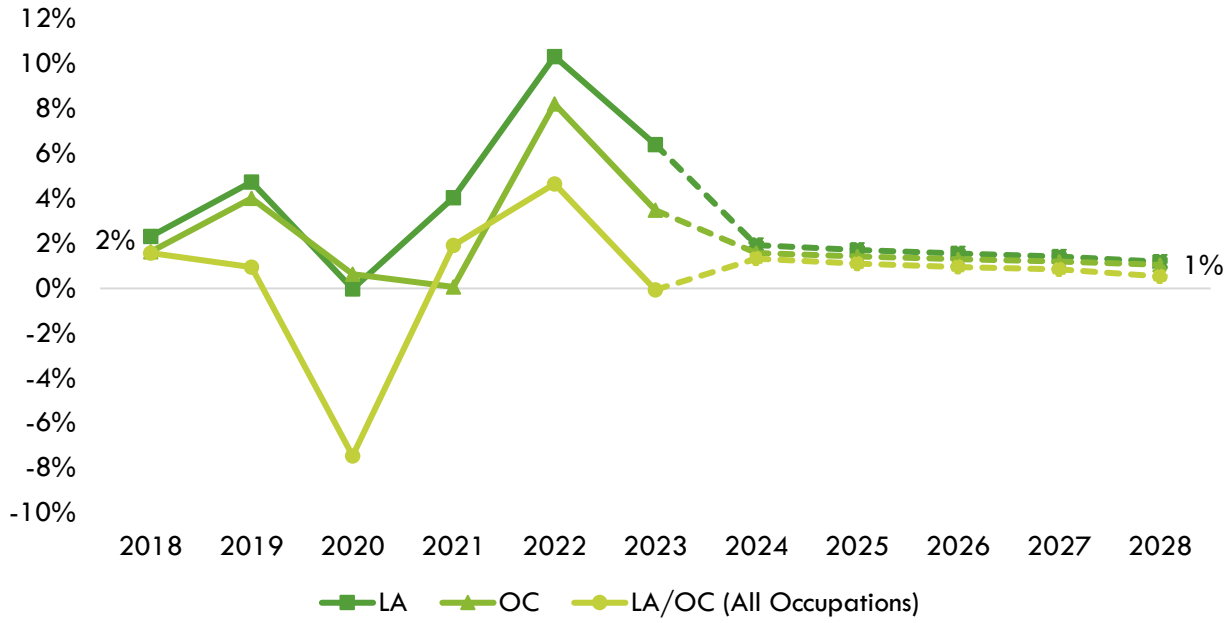


Exhibit 3 shows the five-year occupational demand projections for these middle-skill programming occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase 6% through 2028. There is projected to be 1,049 jobs available annually.

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

Geography	2023 Jobs	2028 Jobs	2023-2028 Change	2023-2028 % Change	Annual Openings
Los Angeles	9,662	10,250	588	6%	789
Orange	3,391	3,525	134	4%	261
Total	**13,053**	**13,776**	**722**	**6%**	**1,049**

Exhibit 4 shows the five-year occupational demand projections for these above middle-skill programming occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase 8% through 2028. There is projected to be 4,852 jobs available annually.

Exhibit 4: Above Middle-Skill Occupational Demand in Los Angeles and Orange Counties

Geography	2023 Jobs	2028 Jobs	2023-2028 Change	2023-2028 % Change	Annual Openings
Los Angeles	45,166	48,994	3,828	8%	3,341
Orange	21,233	22,757	1,524	7%	1,511
Total	**66,399**	**71,751**	**5,352**	**8%**	**4,852**

[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.

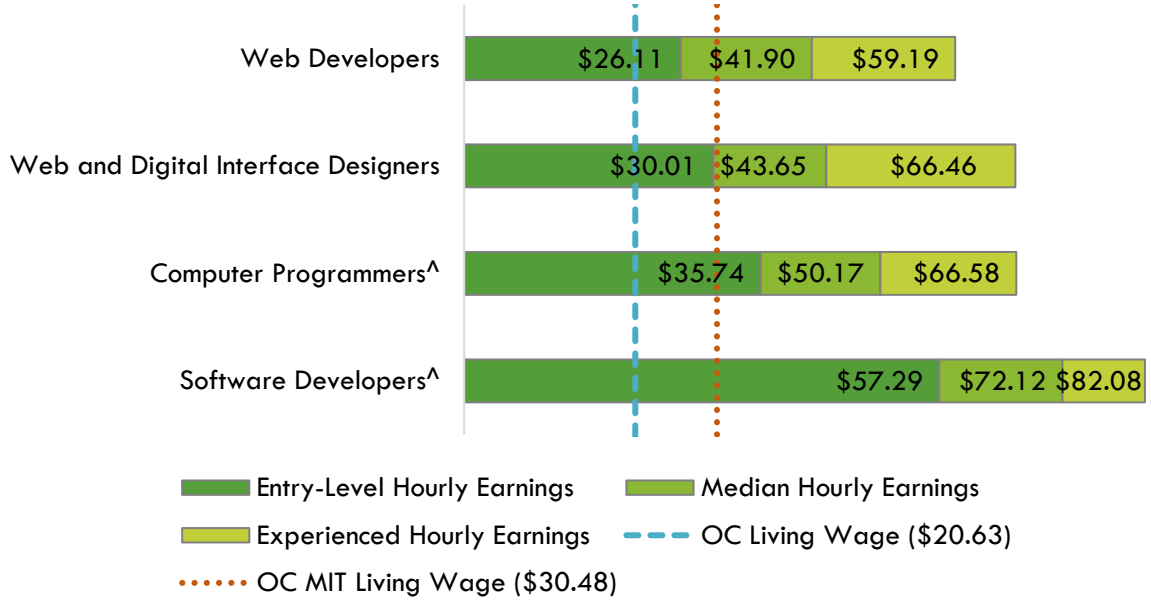
Wages:

The labor market endorsement in this report considers the entry-level hourly wages for these programming 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.

It is important to note that the living wage endorsement criteria in this report uses the California Insight Center's living wage of $20.63 for Orange County, last updated in September 2021, as currently employed by the Chancellor's Office for the *Students Who Attained the Living Wage Strong Workforce Program* metric. However, this figure is outdated and does not reflect recent increases in the cost of living. The MIT Living Wage, updated on February 14, 2024, better accounts for existing economic conditions, with the current MIT Living Wage in Orange County being $30.48. Both figures are notated in the exhibits below.

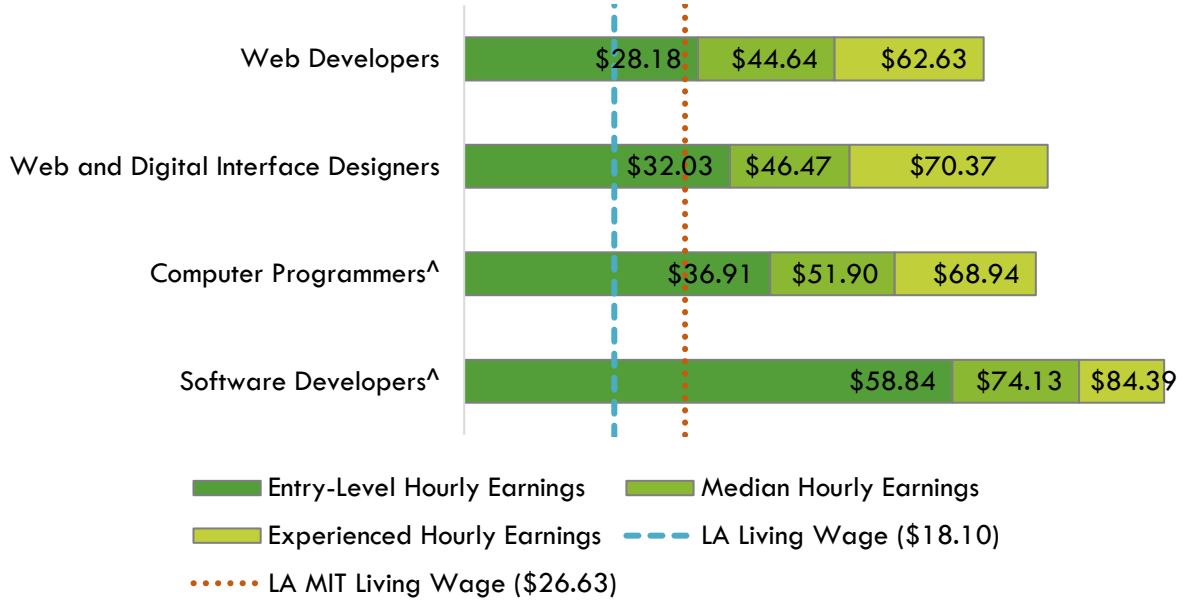
All annual openings for these middle-skill programming occupations have entry-level wages above the California Insight living wage for one adult ($20.63 in Orange County). Typical entry-level hourly wages range between $26.11 and $30.01. Orange County's average wages of $48.19 for these occupations are significantly below the average statewide wage of $60.14 for them. Exhibit 5 shows the wage range for each of these programming occupations in Orange County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 5: Wages by Occupation in Orange County



All annual openings for these middle-skill programming occupations have entry-level wages significantly above the California Insight living wage for one adult ($18.10 in Los Angeles County). Typical entry-level hourly wages range between $28.18 and $32.03. Los Angeles County's average wages of $51.18 are significantly below the average statewide wage of $60.14 for these occupations. Exhibit 6 shows the wage range for each of these programming occupations in Los Angeles County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 6: Wages by Occupation in Los Angeles County



Resilient Jobs and US News & World Report Best Jobs:

Exhibit 7 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. None of the four programming occupations met the criteria to be considered a Great Recession-Resilient Job or a COVID-19 Pandemic Recession-Resilient Job. However, two occupations, *web developers* and *software developers^*, are listed as USN&WR Best Jobs.

Exhibit 7: Resilient Jobs and USN&WR Best Jobs Designations

Occupation	Great Recession-Resilient Job	COVID-19 Pandemic Recession-Resilient Job	2024 USN&WR Best Job
Middle-Skill			
Web Developers	☐	☐	☑
Web and Digital Interface Designers	☐	☐	☐
Above Middle-Skill			
Computer Programmers^	☐	☐	☐
Software Developers^	☐	☐	☑

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 20,183 online job postings related to these programming occupations listed in the past 12 months. Exhibit 8 shows the number of job postings by occupation. Nearly 76% of job postings were for *software developers^*.

Exhibit 8: Number of Job Postings by Occupation (n=20,183)

Occupation	Job Postings	Percentage of Job Postings
Software Developers^	15,353	76%
Web Developers	1,888	9%
Web and Digital Interface Designers	1,871	9%
Computer Programmers^	1,071	5%
Total Postings	**20,183**	**100%**

The top employers for the middle-skill programming occupations in the region, by number of job postings, are shown in Exhibit 9.

Exhibit 9: Middle-Skill Top Employers by Number of Job Postings (n=3,759)

Employer	Job Postings	Percentage of Job Postings
Jobot	90	2%
Insight Global	77	2%
Amazon	69	2%
Motion Recruitment	55	1%
Coalition Technologies	48	1%
Merit America	44	1%
Canteen Vending	38	1%
Disney	29	1%
Netflix	29	1%
Robert Half	29	1%

[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 employers for the above middle-skill programming occupations in the region, by number of job postings, are shown in Exhibit 10.

Exhibit 10: Top Above Middle-Skill Employers by Number of Job Postings (n=16,424)

Employer	Job Postings	Percentage of Job Postings
Amazon	347	2%
Motion Recruitment	325	2%
Raytheon Technologies	315	2%
Northrop Grumman	282	2%
Disney	241	1%
Jobot	235	1%
Insight Global	223	1%
Boeing	206	1%
University of California	200	1%
SpaceX	185	1%

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown for these middle-skill occupations in Exhibit 11.

Exhibit 11: Top Skills for Middle-Skill Occupations by Number of Job Postings (n=3,759)

Top Specialized Skills	Top Soft Skills	Top Computer Skills
JavaScript (Programming Language) (1,260)	Communication (1,423)	JavaScript (Programming Language) (1,260)
User Experience (UX) (1,154)	Problem Solving (729)	Cascading Style Sheets (CSS) (1,085)
Cascading Style Sheets (CSS) (1,085)	Research (640)	HyperText Markup Language (HTML) (915)
Computer Science (1,008)	Detail Oriented (573)	React.js (Javascript Library) (697)
HyperText Markup Language (HTML) (915)	Innovation (531)	Application Programming Interface (API) (672)
Front End (Software Engineering) (866)	Troubleshooting (Problem Solving) (443)	Figma (Design Software) (571)
User Interface (UI) (834)	Leadership (442)	Amazon Web Services (493)
User Experience (UX) Design (731)	Management (424)	Node.js (Javascript Library) (423)
React.js (Javascript Library) (697)	Self-Motivation (313)	Git (Version Control System) (410)
Application Programming Interface (API) (672)	Writing (296)	Python (Programming Language) (386)

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown for these above middle-skill occupations in Exhibit 12.

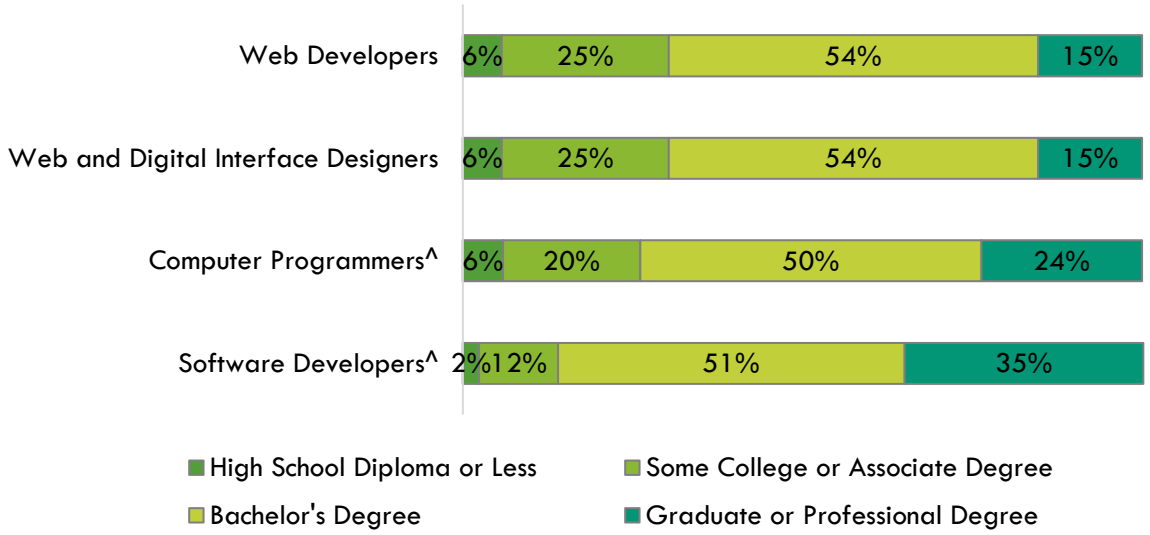
Exhibit 12: Top Skills for Above Middle-Skill Occupations by Number of Job Postings (n=16,424)

Top Specialized Skills	Top Soft Skills	Top Software and Computer Skills
Computer Science (6,106)	Communication (6,030)	Python (Programming Language) (3,967)
Software Engineering (5,085)	Problem Solving (3,510)	Amazon Web Services (3,319)
Software Development (4,400)	Management (3,306)	SQL (Programming Language) (3,295)
Python (Programming Language) (3,967)	Troubleshooting (Problem Solving) (3,014)	Java (Programming Language) (3,068)
Agile Methodology (3,411)	Leadership (2,513)	Application Programming Interface (API) (3,044)
Amazon Web Services (3,319)	Operations (2,412)	JavaScript (Programming Language) (2,944)
SQL (Programming Language) (3,295)	Innovation (1,936)	C++ (Programming Language) (2,657)
Java (Programming Language) (3,068)	Planning (1,807)	C# (Programming Language) (2,163)
Application Programming Interface (API) (3,044)	Writing (1,785)	React.js (Javascript Library) (1,779)
JavaScript (Programming Language) (2,944)	Mathematics (1,578)	Microsoft Azure (1,777)

Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for each of the four programming occupations. However, the national-level educational attainment data indicates 25% of workers in the two middle-skill occupations and between 12% and 25% of workers in the two above middle-skill occupations in the field have completed some college or an associate degree as their highest level of education. Exhibit 13 shows the educational attainment for each occupation, sorted by highest community college educational attainment to lowest.

Exhibit 13: National-level Educational Attainment for Occupations



Of the 50% of the cumulative job postings for these middle-skill programming occupations that listed a minimum education requirement in Los Angeles/Orange County, 88% (1,650) requested a bachelor's degree and 8% (143) requested a high school diploma or an associate degree.

Similarly, of the 61% of the postings for these above middle-skill programming occupations that listed a minimum education requirement, 90% (8,997) requested a bachelor's degree and 6% (628) requested a high school diploma or an associate degree.

Educational Supply

Community College Supply:

Exhibit 14 shows the three-year average number of awards conferred by community colleges in the related TOP codes:

- Marketing and Distribution (0509.00)
- E-Commerce (Business emphasis) (0509.70)
- Digital Media (0614.00)
- Electronic Game Design (0614.20)
- Website Design and Development (0614.30)
- Computer Graphics and Digital Imagery (0614.60)
- Information Technology, General (0701.00)
- Computer Information Systems (0702.00)
- Software Applications (0702.10)
- Computer Software Development (0707.00)
- Computer Programming (0707.10)
- Database Design and Administration (0707.20)
- Computer System Analysis (0707.30)
- Computer Infrastructure and Support (0708.00)
- Computer Networking (0708.10)
- World Wide Web Administration (0709.00)
- E-Commerce (Technology emphasis) (0709.10)
- Computer Electronics (0934.10)
- Applied Design (1009.00)
- Graphic Art and Design (1030.00)
- Health Information Technology (1223.00)

The colleges with the most completions in the region are Orange Coast, Mt. San Antonio, and Long Beach. Over the past 12 months, there were fourteen other related program recommendation requests from regional community colleges.

Exhibit 14: 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
0509.00	Marketing and Distribution	Cerritos	14	26	21	20
		Compton	0	1	0	0
		East LA	8	6	7	7
		El Camino	9	6	6	7
		Glendale	3	4	2	3
		LA City	15	13	13	14
		LA Harbor	0	1	0	0
		LA Pierce	8	10	15	11
		LA Trade	7	4	3	5
		LA Valley	24	27	32	28
		Long Beach	15	18	15	16
		Mt San Antonio	12	9	14	12
		Pasadena	3	17	8	9
		Rio Hondo	11	7	6	8

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Santa Monica	54	61	58	58
		West LA	1	4	3	3
		LA Subtotal	**184**	**214**	**203**	**200**
		Coastline	0	0	7	2
		Cypress	4	0	6	3
		Fullerton	8	4	6	6
		Golden West	4	6	5	5
		Orange Coast	48	20	11	26
		Saddleback	15	19	33	22
		Santa Ana	2	1	1	1
		Santiago Canyon	57	17	50	41
		OC Subtotal	**138**	**67**	**119**	**108**
		Supply Subtotal/Average	**322**	**281**	**322**	**308**
0509.70	E-Commerce (business emphasis)	LA City	0	0	2	1
		Long Beach	7	5	1	4
		LA Subtotal	**7**	**5**	**3**	**5**
		-	-	-	-	-
		OC Subtotal	**-**	**-**	**-**	**-**
		Supply Subtotal/Average	**7**	**5**	**3**	**5**
0614.00	Digital Media	LA Mission	5	5	1	4
		LA Trade	18	12	14	15
		Mt San Antonio	0	0	2	1
		Pasadena	3	15	9	9
		Rio Hondo	1	1	0	1
		Santa Monica	0	19	6	8
		LA Subtotal	**27**	**52**	**32**	**37**
		Coastline	3	3	28	11
		Cypress	2	7	4	4
		Golden West	7	0	0	2
		Irvine	6	3	1	3
		Saddleback	1	1	2	1
		Santa Ana	6	34	71	37
		OC Subtotal	**25**	**48**	**106**	**60**
		Supply Subtotal/Average	**52**	**100**	**138**	**97**
0614.20	Electronic Game Design	Long Beach	0	0	2	1
		Pasadena	1	5	4	3
		LA Subtotal	**1**	**5**	**6**	**4**

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Irvine	0	0	24	8
		OC Subtotal	**0**	**0**	**24**	**8**
		Supply Subtotal/Average	**1**	**5**	**30**	**12**
0614.30	Website Design and Development	Citrus	0	1	0	0
		LA Pierce	4	5	0	3
		Long Beach	0	0	6	2
		Mt San Antonio	6	1	0	2
		Pasadena	1	7	3	4
		Santa Monica	3	2	5	3
		West LA	0	3	4	2
		LA Subtotal	**14**	**19**	**18**	**17**
		Coastline	1	0	4	2
		Fullerton	1	2	0	1
		Irvine	5	4	1	3
		Orange Coast	7	13	8	9
		Saddleback	7	4	6	6
		Santa Ana	1	0	0	0
		Santiago Canyon	6	5	2	4
		OC Subtotal	**28**	**28**	**21**	**26**
		Supply Subtotal/Average	**42**	**47**	**39**	**43**
0614.60	Computer Graphics and Digital Imagery	Citrus	26	7	11	15
		East LA	2	2	4	3
		Mt San Antonio	1	0	0	0
		LA Subtotal	**29**	**9**	**15**	**18**
		Cypress	0	0	1	0
		Fullerton	3	0	0	1
		Irvine	0	4	1	2
		Orange Coast	31	28	18	26
		Saddleback	2	3	7	4
		Santa Ana	3	2	4	3
		OC Subtotal	**39**	**37**	**31**	**36**
		Supply Subtotal/Average	**68**	**46**	**46**	**53**
0701.00	Information Technology, General	East LA	4	30	18	17
		Glendale	3	17	16	12
		LA Harbor	1	2	0	1
		LA Mission	1	4	3	3
		LA Southwest	2	12	1	5

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Long Beach	106	88	73	89
		Mt San Antonio	49	23	12	28
		Santa Monica	1	0	0	0
		West LA	0	6	4	3
		LA Subtotal	**167**	**182**	**127**	**159**
		Santa Ana	3	9	25	12
		OC Subtotal	**3**	**9**	**25**	**12**
		Supply Subtotal/Average	**170**	**191**	**152**	**171**
0702.00	Computer Information Systems	Citrus	4	6	2	4
		Compton	0	12	4	5
		East LA	23	11	23	19
		El Camino	11	28	19	19
		Glendale	6	8	11	8
		LA City	4	3	4	4
		LA Harbor	0	1	2	1
		LA Mission	1	1	0	1
		LA Southwest	0	21	20	14
		LA Trade	15	17	35	22
		Long Beach	3	0	6	3
		Mt San Antonio	6	68	41	38
		Rio Hondo	6	15	14	12
		Santa Monica	0	0	2	1
		West LA	9	14	8	10
		LA Subtotal	**88**	**205**	**191**	**161**
		Coastline	0	2	7	3
		Fullerton	31	49	48	43
		Irvine	0	0	1	0
		Orange Coast	0	1	0	0
		Saddleback	1	0	1	1
		Santa Ana	16	18	8	14
		Santiago Canyon	1	1	5	2
		OC Subtotal	**49**	**71**	**70**	**63**
		Supply Subtotal/Average	**137**	**276**	**261**	**225**
0702.10	Software Applications	Cerritos	2	8	21	10
		LA City	1	0	2	1
		LA Mission	3	0	0	1
		LA Southwest	0	3	0	1

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Mt San Antonio	0	1	1	1
		Santa Monica	6	12	15	11
		LA Subtotal	**12**	**24**	**39**	**25**
		Coastline	8	14	53	25
		Cypress	0	2	1	1
		Irvine	50	89	67	69
		Saddleback	11	10	10	10
		OC Subtotal	**69**	**115**	**131**	**105**
		Supply Subtotal/Average	**81**	**139**	**170**	**130**
		LA City	0	1	0	0
		LA Harbor	0	2	2	1
		LA Mission	0	2	0	1
		LA Pierce	4	7	7	6
		Santa Monica	1	1	2	1
0707.00	Computer Software Development	West LA	0	6	1	2
		LA Subtotal	**5**	**19**	**12**	**12**
		Golden West	6	4	1	4
		Orange Coast	2	0	0	1
		Saddleback	10	15	16	14
		OC Subtotal	**18**	**19**	**17**	**18**
		Supply Subtotal/Average	**23**	**38**	**29**	**30**
		Cerritos	3	7	2	4
		Citrus	3	9	7	6
		East LA	1	0	1	1
		LA City	8	10	19	12
		LA Harbor	2	4	6	4
		LA Mission	7	7	6	7
		LA Pierce	5	5	7	6
		LA Southwest	2	2	3	2
0707.10	Computer Programming	LA Valley	13	8	15	12
		Long Beach	3	7	4	5
		Mt San Antonio	83	125	65	91
		Pasadena	23	23	37	28
		Santa Monica	65	71	55	64
		LA Subtotal	**218**	**278**	**227**	**241**
		Coastline	0	1	2	1
		Cypress	6	5	5	5

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Fullerton	24	28	32	28
		Orange Coast	206	160	250	205
		Santiago Canyon	2	2	3	2
		OC Subtotal	**238**	**196**	**292**	**242**
		Supply Subtotal/Average	**456**	**474**	**519**	**483**
0707.20	Database Design and Administration	Citrus	0	1	0	0
		Long Beach	13	11	10	11
		Mt San Antonio	8	16	22	15
		Pasadena	24	14	10	16
		Santa Monica	2	4	5	4
		LA Subtotal	**47**	**46**	**47**	**47**
		Cypress	0	0	2	1
		Santa Ana	2	2	5	3
		OC Subtotal	**2**	**2**	**7**	**4**
		Supply Subtotal/Average	**49**	**48**	**54**	**50**
0707.30	Computer Systems Analysis	Cerritos	0	5	2	2
		East LA	0	0	4	1
		LA City	1	6	5	4
		LA Harbor	1	1	0	1
		LA Mission	1	1	2	1
		LA Pierce	6	5	6	6
		LA Trade	0	0	2	1
		Mt San Antonio	0	9	6	5
		Rio Hondo	0	3	2	2
		LA Subtotal	**9**	**30**	**29**	**23**
		-	-	-	-	-
		OC Subtotal	**-**	**-**	**-**	**-**
		Supply Subtotal/Average	**9**	**30**	**29**	**23**
0708.00	Computer Infrastructure and Support	Cerritos	4	9	14	9
		East LA	0	3	11	5
		El Camino	0	5	8	4
		Glendale	4	11	3	6
		LA City	5	12	19	12
		LA Harbor	1	2	1	1
		LA Mission	17	32	20	23
		LA Valley	4	3	2	3
		Long Beach	8	2	24	11

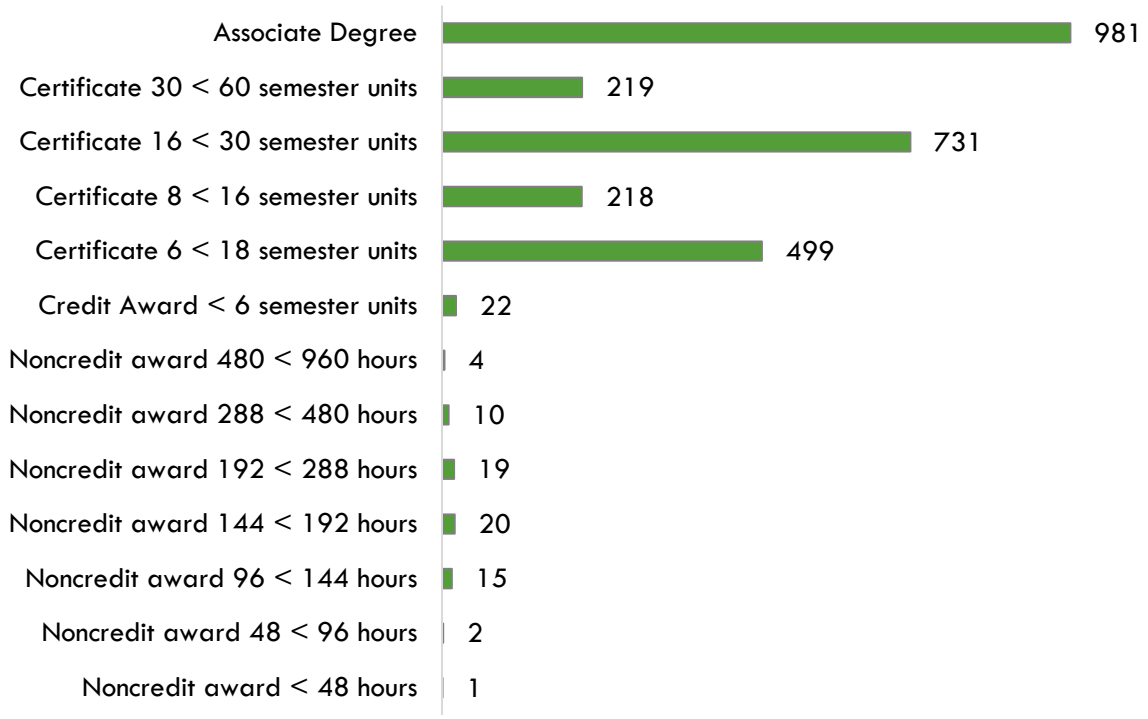
TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Mt San Antonio	24	36	17	26
		Pasadena	24	8	17	16
		Rio Hondo	11	19	30	20
		West LA	16	7	4	9
		LA Subtotal	**118**	**149**	**170**	**146**
		Coastline	73	91	81	82
		Cypress	1	1	0	1
		Orange Coast	5	7	2	5
		Saddleback	3	13	14	10
		Santa Ana	27	14	20	20
		Santiago Canyon	0	0	1	0
		OC Subtotal	**109**	**126**	**118**	**118**
		Supply Subtotal/Average	**227**	**275**	**288**	**263**
0708.10	Computer Networking	Cerritos	8	6	10	8
		Glendale	0	2	2	1
		LA City	4	8	6	6
		LA Pierce	12	19	14	15
		Long Beach	48	52	70	57
		Mt San Antonio	4	25	13	14
		Rio Hondo	2	5	7	5
		Santa Monica	0	0	1	0
		West LA	58	24	24	35
		LA Subtotal	**136**	**141**	**147**	**141**
		Coastline	92	49	17	53
		Cypress	61	71	116	83
		Fullerton	1	0	0	0
		Irvine	10	18	27	18
		Saddleback	19	15	17	17
		Santa Ana	23	45	47	38
		OC Subtotal	**206**	**198**	**224**	**209**
		Supply Subtotal/Average	**342**	**339**	**371**	**351**
0709.00	World Wide Web Administration	Cerritos	0	3	3	2
		Glendale	10	7	2	6
		LA Pierce	2	0	2	1
		Long Beach	34	44	39	39
		Mt San Antonio	0	0	4	1
		Santa Monica	16	0	3	6

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		West LA	6	7	8	7
		LA Subtotal	**68**	**61**	**61**	**63**
		Fullerton	1	0	0	0
		Saddleback	2	3	3	3
		OC Subtotal	**3**	**3**	**3**	**3**
		Supply Subtotal/Average	**71**	**64**	**64**	**66**
0709.10	E-Commerce (technology emphasis)	East LA	1	2	1	1
		LA Subtotal	**1**	**2**	**1**	**1**
		Saddleback	0	2	2	1
		OC Subtotal	**0**	**2**	**2**	**1**
		Supply Subtotal/Average	**1**	**4**	**3**	**3**
0934.10	Computer Electronics	East LA	7	24	24	18
		El Camino	10	9	18	12
		LA Trade	14	16	2	11
		Mt San Antonio	7	18	17	14
		LA Subtotal	**38**	**67**	**61**	**55**
		Orange Coast	4	2	0	2
		Saddleback	22	10	8	13
		OC Subtotal	**26**	**12**	**8**	**15**
		Supply Subtotal/Average	**64**	**79**	**69**	**71**
1009.00	Applied Design	-	-	-	-	-
		LA Subtotal	**-**	**-**	**-**	**-**
		Orange Coast	1	0	0	0
		OC Subtotal	**1**	**0**	**0**	**0**
		Supply Subtotal/Average	**1**	**0**	**0**	**0**
1030.00	Graphic Art and Design	Cerritos	14	13	18	15
		East LA	8	6	9	8
		El Camino	0	0	1	0
		Glendale	9	10	8	9
		LA City	8	19	14	14
		LA Harbor	0	0	1	0
		LA Pierce	13	22	12	16
		LA Valley	1	5	1	2
		Long Beach	8	7	5	7
		Mt San Antonio	20	21	25	22
		Pasadena	15	12	11	13
		Rio Hondo	28	23	54	35

TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
		Santa Monica	43	51	68	54
		LA Subtotal	**167**	**189**	**227**	**194**
		Cypress	4	6	18	9
		Fullerton	14	15	18	16
		Golden West	20	16	13	16
		Irvine	21	27	17	22
		Saddleback	19	22	22	21
		Santa Ana	3	0	0	1
		Santiago Canyon	4	5	5	5
		OC Subtotal	**85**	**91**	**93**	**90**
		Supply Subtotal/Average	**252**	**280**	**320**	**284**
1223.00	Health Information Technology	East LA	69	36	25	43
		LA Subtotal	**69**	**36**	**25**	**43**
		Cypress	25	16	7	16
		Saddleback	13	15	15	14
		OC Subtotal	**38**	**31**	**22**	**30**
		Supply Subtotal/Average	**107**	**67**	**47**	**74**
		Supply Total/Average	**2,482**	**2,788**	**2,954**	**2,741**

Exhibit 15 shows the annual average community college awards by type from 2020-21 to 2022-23. The plurality of the awards are for associate degrees, followed by certificates between 16 and less than 30 semester units and certificates between 6 and less than 18 semester units.

Exhibit 15: Annual Average Community College Awards by Type, 2020-2023



Community College Student Outcomes:

Exhibit 16 shows the Strong Workforce Program (SWP) metrics for computer software development programs in Rancho Santiago Community College District (RSCCD), the Orange County Region, and California. Of the 960 Orange County computer software development students in the 2020-21 academic year, 43% (412) attended an RSCCD college.

Additionally, RSCCD students that exited computer software development programs in the 2020-21 academic year had significantly lower median annual earnings ($31,740 or $15.26 per hour) compared to all computer software development students in Orange County ($44,208 or $21.25 per hour). A lower percentage of RSCCD computer software development students attained the California Insight living wage (38%) when compared to all computer software development students in Orange County (50%).

Exhibit 16: Computer Software Development (0707.00)
Strong Workforce Program Metrics, 2021-22[5]

SWP Metric	RSCCD	OC Region	California
SWP Students	412	960	5,363
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	15%	19%	24%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	Insufficient Data	Insufficient Data	57%

[5] All SWP metrics are for 2020-21 unless otherwise noted.

SWP Metric	RSCCD	OC Region	California
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	Insufficient Data	15	114
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2019-20)	13	66	888
SWP Students with a Job Closely Related to Their Field of Study (2019-20)	Insufficient Data	57%	71%
Median Annual Earnings for SWP Exiting Students (2020-21)	$31,740 ($15.26)	$44,208 ($21.25)	$52,014 ($25.01)
Median Change in Earnings for SWP Exiting Students (2020-21)	33%	20%	23%
SWP Exiting Students Who Attained the Living Wage (2020-21)	38%	50%	62%

Non-Community College Supply:

To comprehensively analyze the regional supply, it is crucial to include data from other institutions offering programming training programs. Exhibit 17 displays the annual and three-year average awards granted by these institutions under the related Classification of Instructional Programs (CIP) codes:

- Digital Communication and Media/Multimedia (09.0702)
- Computer and Information Sciences, General (11.0101)
- Information Technology (11.0103)
- Computer Programming/Programmer, General (11.0201)
- Computer Programming, Specific Platforms (11.0205)
- Computer Programming, Other (11.0299)
- Computer Science (11.0701)
- Web Page, Digital/Multimedia and Information Resources Design (11.0801)
- Computer Graphics (11.0803)
- Web/Multimedia Management and Webmaster (11.1004)
- Computer Engineering Technology/Technician (15.1201)
- Computer/Computer Systems Technology/Technician (15.1202)
- Data Science, General (30.7001)
- Data Analytics, General (30.7101)
- Design and Visual Communications, General (50.0401)
- Graphic Design (50.0409)
- Digital Marketing (52.1404)

No awards were conferred under the follow related CIP codes:

- Computer Programming, Specific Applications (11.0202)
- Computer Programming, Vendor/Product Certification (11.0203)
- Computer Game Programming (11.0204)
- Computer Systems Analysis/Analyst (11.0501)
- Cloud Computing (11.0902)
- Computer Software Technology/Technician (15.1204)
- Data Visualization (30.7103)
- Medical Office Computer Specialist/Assistant (51.0709)

The available data covers 2019 to 2022. During this period, non-community college institutions in the region conferred an average of 6,002 awards annually in related programs.

Exhibit 17: Regional Non-Community College Awards, 2019-2022

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
09.0702	Digital Communication and Media / Multimedia	Azusa Pacific University	0	0	3	1
		California Institute of the Arts	11	5	6	7
		California State University-Dominguez Hills	41	57	33	44
		Columbia College Hollywood	0	28	5	11
		Fremont University	1	0	0	0
		Marymount California University	10	9	9	9
		University of Southern California	40	48	56	48
		Vanguard University of Southern California	2	1	0	1
		Westcliff University	0	0	34	11
	Supply Subtotal/Average		**105**	**148**	**146**	**133**
11.0101	Computer and Information Sciences, General	Azusa Pacific University	21	25	5	17
		Chapman University	16	20	25	20
		Los Angeles Pacific College	6	2	2	3
		Loyola Marymount University	27	46	60	44
		Mount Saint Mary's University	0	0	0	0
		Pacific States University	2	2	4	3
		Pitzer College	0	1	0	0
		The Master's University and Seminary	9	5	3	6
		University of California-Irvine	4	1	0	2
		University of La Verne	23	36	20	26
		University of Massachusetts Global	30	36	37	34
		University of the People	203	292	478	324
		Vanguard University of Southern California	0	0	0	0

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
		Westcliff University	0	4	22	9
		Supply Subtotal/Average	**341**	**470**	**656**	**489**
11.0103	Information Technology	Bethesda University	0	0	0	0
		Brand College	13	17	18	16
		California Intercontinental University	2	0	0	1
		California State Polytechnic University-Pomona	0	16	21	12
		California State University-Dominguez Hills	4	10	17	10
		California State University-Fullerton	58	62	19	46
		California State University-Los Angeles	180	141	118	146
		California State University-Northridge	29	51	45	42
		Platt College-Anaheim	15	17	12	15
		Platt College-Los Angeles	12	6	3	7
		University of La Verne	2	3	15	7
		University of Massachusetts Global	0	0	1	0
		Westcliff University	0	3	65	23
		Supply Subtotal/Average	**315**	**326**	**334**	**325**
11.0201	Computer Programming / Programmer, General	ABCO Technology	46	34	14	31
		Platt College-Anaheim	4	0	0	1
		Supply Subtotal/Average	**50**	**34**	**14**	**33**
11.0205	Computer Programming, Specific Platforms	ABCO Technology	0	0	0	0
		Supply Subtotal/Average	**0**	**0**	**0**	**0**
11.0299	Computer Programming, Other	Loyola Marymount University	0	0	0	0
		Supply Subtotal/Average	**0**	**0**	**0**	**0**

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
11.0701	Computer Science	Azusa Pacific University	0	0	9	3
		Biola University	18	18	15	17
		California Institute of Technology	73	84	78	78
		California State Polytechnic University-Pomona	266	297	229	264
		California State University-Dominguez Hills	77	90	96	88
		California State University-Fullerton	360	396	400	385
		California State University-Long Beach	316	304	312	311
		California State University-Los Angeles	177	182	172	177
		California State University-Northridge	172	228	274	225
		Chapman University	30	45	50	42
		Claremont McKenna College	25	17	13	18
		Concordia University-Irvine	0	0	3	1
		Harvey Mudd College	47	48	48	48
		Occidental College	14	14	31	20
		Pitzer College	9	5	10	8
		Pomona College	34	33	49	39
		Scripps College	11	4	6	7
		Southern California Institute of Technology	10	7	5	7
		The Master's University and Seminary	0	0	0	0
		University of California-Irvine	886	990	869	915
		University of California-Los Angeles	437	507	507	484
		University of Southern California	1,273	1,386	1,015	1,225

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
		Supply Subtotal/Average	**4,235**	**4,655**	**4,191**	**4,360**
11.0801	Web Page, Digital / Multimedia and Information Resources Design	Los Angeles Pacific College	0	4	6	3
		Westcliff University	0	3	4	2
		Supply Subtotal/Average	**0**	**7**	**10**	**6**
11.0803	Computer Graphics	ABC Adult School	4	3	6	4
		Los Angeles Pacific College	12	5	6	8
		University of California-Irvine	0	0	0	0
		Supply Subtotal/Average	**16**	**8**	**12**	**12**
11.1004	Web / Multimedia Management and Webmaster	ABCO Technology	37	35	161	78
		Los Angeles Pacific College	1	1	0	1
		Supply Subtotal/Average	**38**	**36**	**161**	**78**
15.1201	Computer Engineering Technology / Technician	California State University-Long Beach	4	5	6	5
		Supply Subtotal/Average	**4**	**5**	**6**	**5**
15.1202	Computer / Computer Systems Technology / Technician	Learnet Academy Inc	4	2	2	3
		University of La Verne	0	0	0	0
		Supply Subtotal/Average	**4**	**2**	**2**	**3**
30.7001	Data Science, General	Vanguard University of Southern California	0	0	0	0
		Supply Subtotal/Average	**0**	**0**	**0**	**0**
30.7101	Data Analytics, General	Mount Saint Mary's University	0	0	0	0
		University of Massachusetts Global	3	7	8	6
		Westcliff University	0	0	0	0
		Supply Subtotal/Average	**3**	**7**	**8**	**6**
50.0401	Design and Visual Communications, General	Azusa Pacific University	0	0	12	4
		Bethesda University	0	0	0	0
		Biola University	3	9	9	7

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
		California State Polytechnic University-Pomona	0	0	0	0
		Columbia College Hollywood	0	7	1	3
		FIDM-Fashion Institute of Design & Merchandising	90	69	57	72
		Gnomon	19	42	31	31
		Los Angeles Pacific College	13	1	1	5
		Otis College of Art and Design	36	30	39	35
		University of California-Los Angeles	0	0	1	0
		University of La Verne	0	0	0	0
		University of Southern California	12	30	49	30
		Supply Subtotal/Average	**173**	**188**	**200**	**187**
50.0409	Graphic Design	Art Center College of Design	96	99	106	100
		California Institute of the Arts	12	12	15	13
		California State Polytechnic University-Pomona	89	113	105	102
		California State University-Dominguez Hills	0	0	0	0
		Chapman University	27	24	29	27
		Columbia College Hollywood	0	9	4	4
		Concordia University-Irvine	10	7	9	9
		FIDM-Fashion Institute of Design & Merchandising	38	25	12	25
		Laguna College of Art and Design	25	26	24	25
		Los Angeles Film School	28	47	52	42
		Los Angeles Pacific College	8	2	7	6
		New York Film Academy	0	0	0	0

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
		Otis College of Art and Design	11	15	9	12
		University of La Verne	0	0	0	0
		Supply Subtotal/Average	**344**	**379**	**372**	**365**
52.1404	Digital Marketing	Mount Saint Mary's University	0	0	0	0
		Supply Subtotal/Average	**0**	**0**	**0**	**0**
		Supply Total/Average	**5,628**	**6,265**	**6,112**	**6,002**

Regional Demographics

This section examines demographic data for Orange County community college students in computer software development programs compared to the OC population, along with occupational data, to identify potential diversity and equity issues addressable by community college programs.

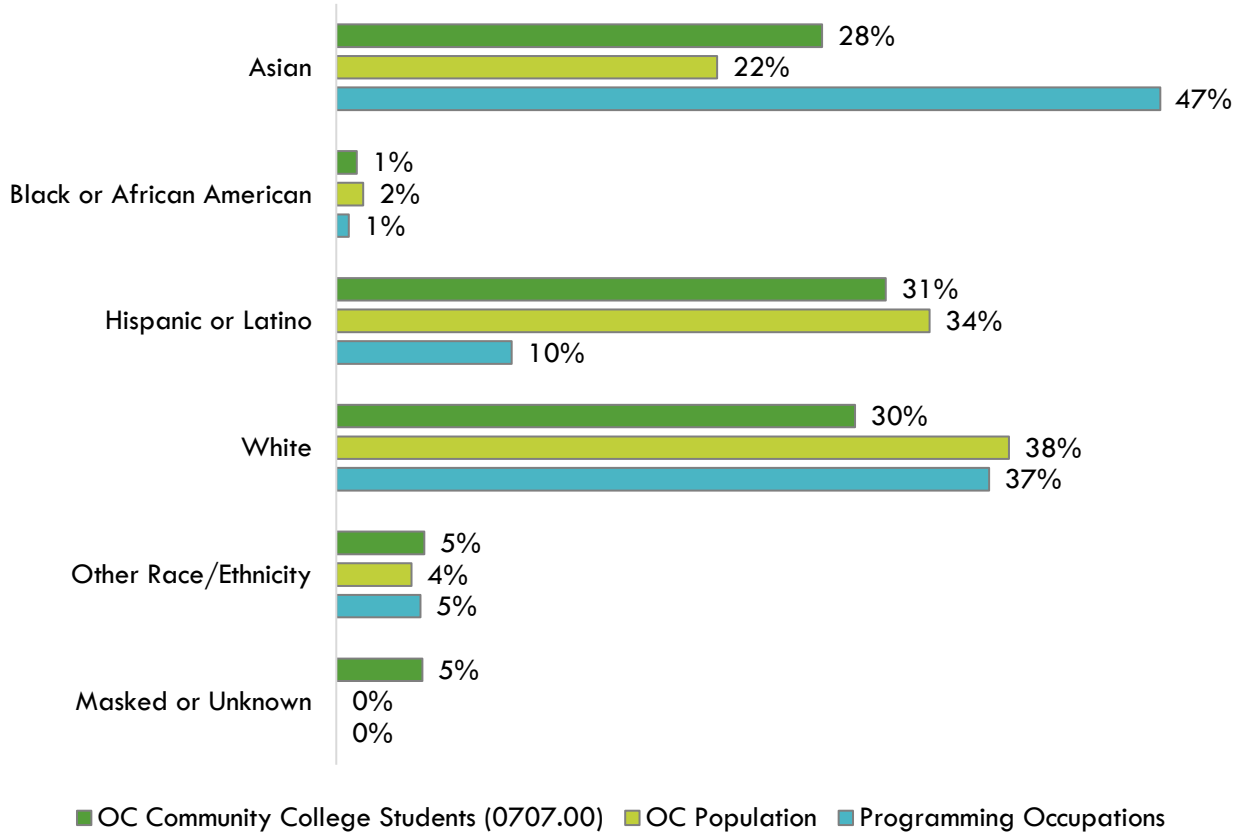
Ethnicity:

Exhibit 18 compares the ethnicity of Orange County community college students enrolled in computer software development programs, the overall Orange County population, and occupation-specific data for the four programming occupations included in this report.

Notably, 47% of workers employed in these programming occupations are Asian, which is much higher than the population (22%) and community college computer software development students (28%). Furthermore, despite accounting for roughly a third of community college computer software development students (31%) and the population (34%), Hispanic or Latino individuals account for only 10% of workers in the field.

Examining disaggregated data for each occupation (not shown), Asian individuals account for the plurality of *software developers*^ (50%), which offers the highest entry-level wages of the four programming occupations. Though Asian workers also account for the plurality of *web and digital interface designers* (45%) and *computer programmers*^ (41%), white individuals closely follow with 44% and 38%, respectively for the two occupations. These two occupations offer the third and second highest entry-level wages of the four programming occupations, respectively. The occupation with the highest percentages of white (48%) and Hispanic or Latino (26%) workers is *web developers*, which provides the lowest entry-level wages of the four programming occupations.

Exhibit 18: Program and County Demographics by Ethnicity



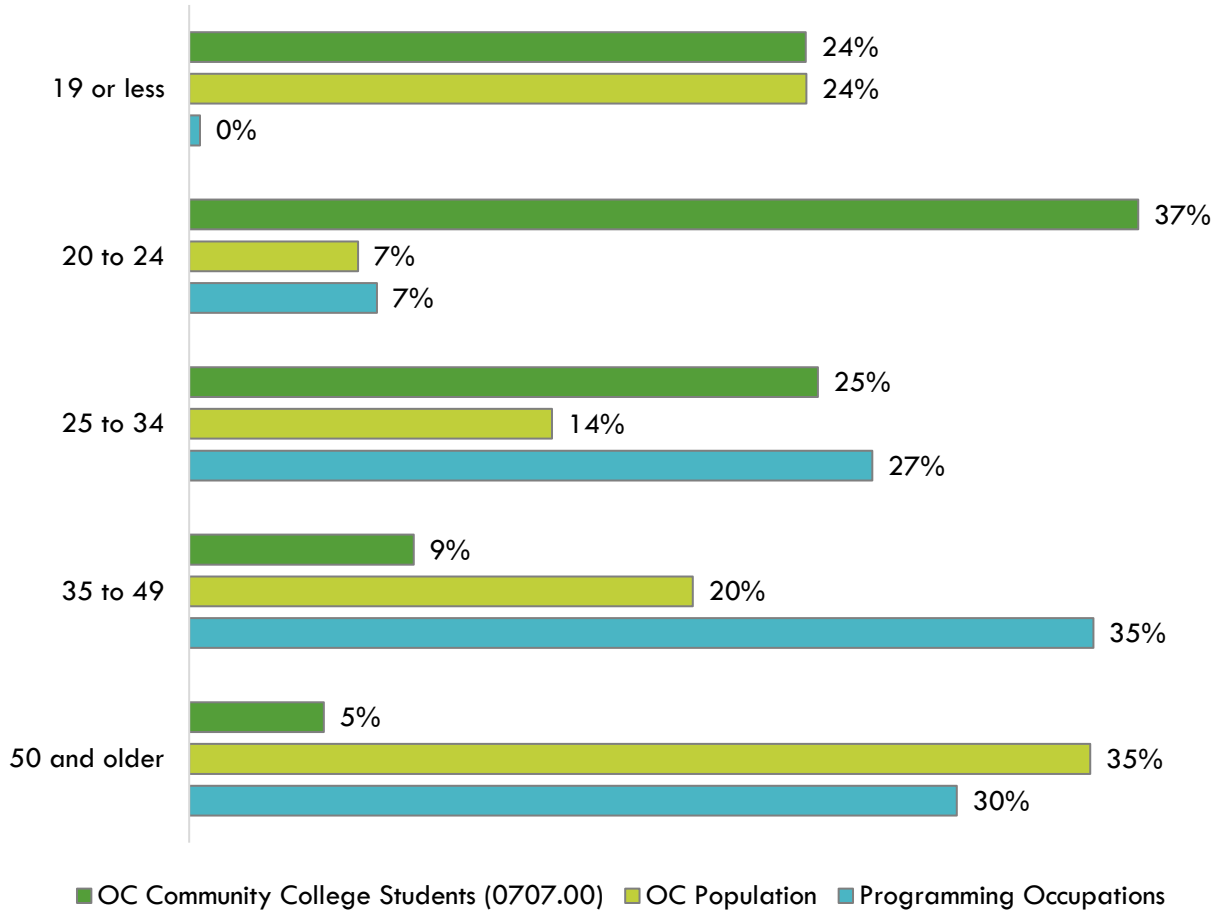
Age:

Exhibit 19 compares the age of Orange County community college students enrolled in computer software development programs, the overall Orange County population, and occupation-specific data for the four programming occupations included in this report.

Nearly 65% of workers in these programming occupations are age 35 and older, which is higher than the population (55%) and significantly higher than community college computer software development students (14%).

Examining disaggregated data for each occupation (not shown), the occupation with the highest percentage of workers age 50 and older is *computer programmers*^ (42%), which has the second highest entry-level wages of all four programming occupations. Individuals age 35 to 49 account for the plurality of workers in *software developers*^ (37%) and *web developers* (35%), which offer the highest and lowest entry-level wages, respectively. Workers age 25 to 34 account for the plurality of *web and digital interface designers* (31%). This occupation offers the third highest entry-levels wages.

Exhibit 19: Program and County Demographics by Age

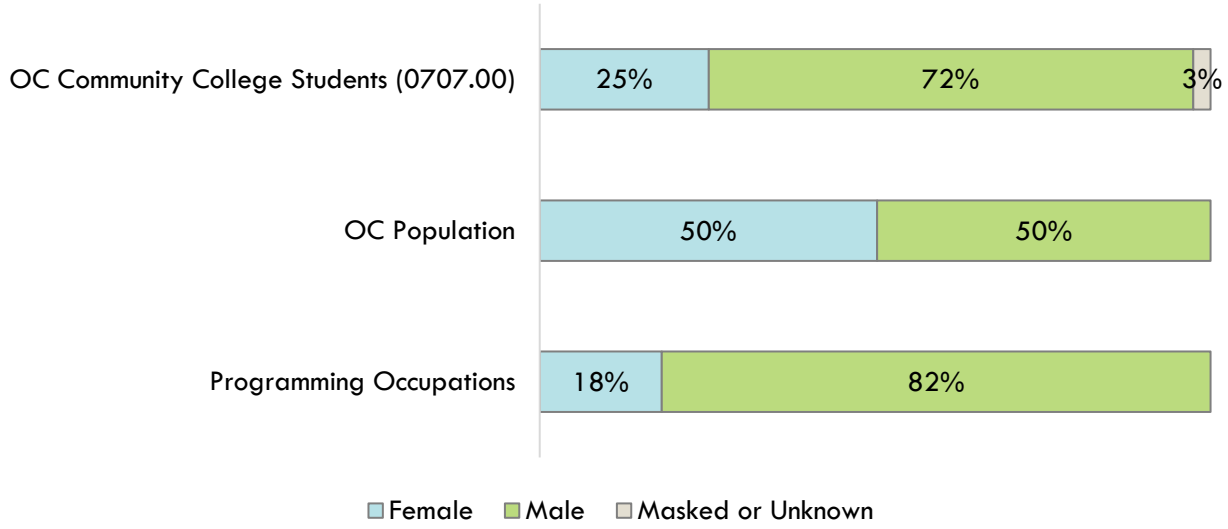


Sex:

Exhibit 20 compares the sex of Orange County community college students enrolled in computer software development programs, the overall Orange County population, and occupation-specific data for these programming occupations.

Though the population is evenly split among men and women, only 25% of community college computer software development students and 18% of workers in the field are women. Examining disaggregated data for each occupation (not shown), only one of the four programming occupations has a higher percentage of women (59%) than men (41%): *web and digital interface designers*. This occupation offers the third highest entry-level wages of the four occupations.

Exhibit 20: Program and County Demographics by Sex



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	The living wage is derived from the Insight Center's California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data, last updated in September 2021, assesses the cost of housing, food, child care, health care, transportation, and taxes. For more information, see: https://insightcced.org/family-needs-calculator/ The living wage for one adult in Orange County is $20.63 per hour ($42,910.40 annually). This figure is used by the CCCCO to calculate the percentage of students that attained the regional living wage. However, this figure is outdated and does not reflect recent increases in the cost of living. The MIT Living Wage, updated on February 14, 2024, better accounts for existing economic conditions, with the current MIT Living Wage in Orange County being $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

Data Type	Source
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
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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