C·O·E CENTERS OF EXCELLENCE FOR LABOR MARKET RESEARCH

Program Endorsement Brief: 0707.00/ Computer Software Development
Software Engineering, Apple Coding Foundation & Apple Developer
Los Angeles/Orange County Center of Excellence, April 2021

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met	☐	Endorsed: Some Criteria Met	☒	Not Endorsed	☐
Program Endorsement Criteria						
Supply Gap:	Yes ☑				No ☐	
Living Wage: (Entry-Level, 25th)	Yes ☑				No ☐	
Education:	Yes ☐				No ☑	
Emerging Occupation(s)						
Yes ☐				No ☑		

The Los Angeles/Orange County Center of Excellence for Labor Market Research COE prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to one middle-skill occupation: *web developers and digital interface designers* (15-1257); and two above middle-skill occupations: *computer programmers* (15-1251); *software developers and software quality assurance analysts and testers* (15-1256). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.[1] This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for these occupations in the region. While entry-level wages exceed the living wage in both Los Angeles and Orange counties, occupations in this report typically require a bachelor's degree. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

Demand:
- *Supply Gap Criteria* – Over the next five years, there is projected to be **5,826 jobs available annually** in the region due to new job growth and replacements, **which is more than the 792 awards conferred annually** by educational institutions in the region.
- *Living Wage Criteria* – In Los Angeles County, all three occupations have entry-level wages above the county's living wage ($15.04/hour).[2]

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[1] The COE classifies middle-skill jobs as the following:
- 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.

[2] Living wage data was pulled from California Family Needs Calculator on 3/29/2021. For more information, visit the California Family Needs Calculator website: https://insightcced.org/2018-family-needs-calculator/.

- *Educational Criteria –* Within the LA/OC region, ***88% of the annual job openings*** for occupations related to program ***typically require a bachelor's degree.***
  - National-level educational attainment data indicates **between 11.7% and 23.4% of workers in the field have completed some college or an associate degree.**

Supply:
- There are **26 community colleges** in the LA/OC region that issue awards related to these occupations, conferring an average of **413 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **379 awards conferred annually** in related training programs by non-community college institutions.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for the three occupations of interest. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 7% through 2024. There will be nearly 5,850 job openings per year through 2024 due to job growth and replacements.

This report includes employment projection data by Emsi, which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties[3]

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	50,205	53,808	3,603	7%	3,934
Orange	24,390	26,063	1,674	7%	1,892
Total	**74,595**	**79,871**	**5,276**	**7%**	**5,826**

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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.

Wages

The labor market endorsement in this report considers the entry-level hourly wages for three occupations of interest, as they relate to the county's living wage. Orange County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

Los Angeles County: The three occupations in this report have entry-level wages above the living wage for one adult ($15.04 in Los Angeles County). Typical entry-level hourly wages are in a range between $22.53 and $44.43. Experienced workers can expect to earn wages between $47.16 and $72.55, which are higher than the living wage estimate.

Orange County: The three occupations in this report have entry-level wages above the living wage for one adult ($17.36 in Orange County). Typical entry-level hourly wages are in a range between $21.26 and $43.43. Experienced workers can expect to earn wages between $44.79 and $70.77, which are higher than the living wage estimate.

Job Postings

There were 7,155 online job postings related to these occupations listed in the past 12 months. The highest number of job postings were for UX Designer, UI Designer, and Front End Developer. The top skills were JavaScript, Software Development, and SQL. The top employers, by number of job postings, in the region were Anthem Blue Cross, University of California, IBM, and Amazon.

It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.

Educational Attainment

In the LA/OC region, the majority of annual job openings (88%) typically require a bachelor's degree. National-level educational attainment data indicates between 11.7% and 23.4% of workers in the field have completed some college or an associate degree. Of the 53% of job postings listing a minimum education requirement in Los Angeles/Orange County, 8% (313) requested high school or vocational training, 2% (71) requested an associate degree, and 90% (3,404) requested a bachelor's degree.

Educational Supply

Community College Supply—Exhibit 2 shows the annual and three-year average number of awards conferred by community colleges in the related TOP codes: Computer Information Systems (0702.00); Computer Software Development (0707.00); and Computer Programming (0707.10). The colleges with the most completions in the region are: Mt. San Antonio, Santa Monica, and Orange Coast. Over the past 12 months, there were six other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0702.00	Computer Information Systems	Citrus	5	7	5	6
		Compton	1	-	1	1
		East LA	14	16	19	16
		El Camino	15	18	14	16
		Glendale	2	-	-	1
		LA City	3	4	1	3
		LA Mission	3	9	5	6
		LA Trade	23	14	8	15
		Pasadena	2	1	-	1
		Rio Hondo	10	19	21	17
		West LA	13	6	8	9
		LA Subtotal	**91**	**94**	**82**	**89**
		Cypress	5	8	5	6
		Fullerton	7	20	15	14
		Orange Coast	-	3	4	2
		Santa Ana	18	6	4	9
		Santiago Canyon	2	2	3	2
		OC Subtotal	**32**	**39**	**31**	**34**
	Supply Subtotal/Average		**123**	**133**	**113**	**123**
0707.00	Computer Software Development	LA City	-	-	1	0
		Pasadena	4	-	-	1
		LA Subtotal	**4**	**-**	**1**	**2**
		Cypress	1	1	1	1
		Golden West	7	3	4	5
		Orange Coast	5	7	7	6
		Saddleback	3	3	13	6
		OC Subtotal	**16**	**14**	**25**	**18**
	Supply Subtotal/Average		**20**	**14**	**26**	**20**
0707.10	Computer Programming	Cerritos	1	4	-	2
		East LA	5	6	8	6
		Glendale	1	2	2	2
		LA City	43	-	-	14
		LA Mission	2	5	6	4

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		LA Pierce	6	9	18	11
		LA Southwest	2	1	-	1
		LA Valley	26	10	7	14
		Long Beach	-	2	4	2
		Mt San Antonio	68	62	119	83
		Pasadena	1	8	11	7
		Santa Monica	25	42	44	37
		West LA	-	-	1	0
		LA Subtotal	**180**	**151**	**220**	**184**
		Cypress	27	18	22	22
		Fullerton	-	-	16	5
		Irvine	16	10	8	11
		Orange Coast	29	29	31	30
		Santa Ana	-	1	13	5
		Santiago Canyon	-	30	9	13
		OC Subtotal	**72**	**88**	**99**	**86**
	Supply Subtotal/Average		252	239	319	270
	Supply Total/Average		**395**	**386**	**458**	**413**

Non-Community College Supply—Since some of these occupations typically require a bachelor's degree, it is important to consider the supply from non-community college institutions in the region that provide training programs for these occupations. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: 11.0103/Information Technology; and 11.0201/Computer Programming/Programmer, General.

Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, four-year colleges in the region conferred an average of 379 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2014-2017

CIP Code	Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Award Average
11.0103	Information Technology	Argosy University-Orange County	-	1	-	-
		Bethesda University	1	1	-	1
		Brand College	55	42	28	42
		California Intercontinental University	-	0	1	-
		California State University-Los Angeles	102	92	117	104
		California State University-Northridge	49	48	43	47
		Stanbridge University	29	21	25	25
		Trident University International	96	77	74	82
		University of Phoenix-California	2	3	16	7
		Supply Subtotal/Average	**334**	**285**	**304**	**308**
11.0201	Computer Programming/Programmer, General	ABCO Technology	6	12	18	12
		ITT Technical Institute-San Dimas	5	-	-	2
		University of Phoenix-California	68	62	43	58
		Supply Subtotal/Average	**79**	**74**	**61**	**71**
		Supply Total/Average	**413**	**359**	**365**	**379**

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Computer Programmers (15-1251)	5,321	5,097	(224)	(4%)	316	$34.94	$44.91	$56.33
Software Developers and Software Quality Assurance Analysts and Testers (15-1256)	38,184	41,711	3,527	9%	3,098	$44.43	$58.10	$72.55
Web Developers and Digital Interface Designers (15-1257)	6,700	6,999	299	4%	519	$22.53	$33.68	$47.16
Total	**50,205**	**53,808**	**3,603**	**7%**	**3,934**			

Exhibit 5. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Computer Programmers (15-1251)	2,501	2,397	(104)	(4%)	149	$34.31	$44.02	$55.17
Software Developers and Software Quality Assurance Analysts and Testers (15-1256)	19,287	20,973	1,686	9%	1,545	$43.43	$56.72	$70.77
Web Developers and Digital Interface Designers (15-1257)	2,602	2,693	92	4%	198	$21.26	$31.88	$44.79
Total	**24,390**	**26,063**	**1,674**	**7%**	**1,892**			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry Level Educational Attainment
Computer Programmers (15-1251)	7,822	7,494	(328)	(4%)	465	Bachelor's degree
Software Developers and Software Quality Assurance Analysts and Testers (15-1256)	57,471	62,685	5,213	9%	4,644	Bachelor's degree
Web Developers and Digital Interface Designers (15-1257)	9,302	9,693	391	4%	718	Associate degree
Total	**74,595**	**79,871**	**5,276**	**7%**	**5,826**	

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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