

**Program Endorsement Brief: 0707.10/Computer Programming  
iOS Programming; Android Programming; Object-Oriented Design & Programming;  
Web Programming; Java Programming**

Los Angeles/Orange County Center of Excellence, February 2019

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**Summary:**

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide regional labor market supply and demand data related to computer programming. 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 relevant occupations.

The following summarizes key findings from this data brief:

- Computer programming occupations are increasing by 6% over the next five years, and more than 5,500 job openings will be available annually due to new job growth and replacement need.
- Over the past 12 months, there were 55,007 online job postings related to computer and web programming in Los Angeles and Orange Counties.
- Three other related program recommendation requests were received during 2018 from regional community colleges.
- Eighteen colleges in the region have existing programs closely related to computer programming.
- Between 2014 and 2017, community colleges in the region conferred an average of 219 awards annually (associate degrees and certificates) in related training programs.

**Occupational Demand**—In Los Angeles/Orange County, the number of jobs for computer and web programming occupations is projected to increase by 6%. There will be more than 5,500 job openings per year through 2022 (Exhibit 1).

**Exhibit 1: Occupational demand in Los Angeles and Orange Counties<sup>1</sup>**

Geography	2017 Jobs	2022 Jobs	2017-2022 Change	2017-2022 % Change	Annual Openings
Los Angeles	46,356	48,902	2,546	5%	3,598
Orange	24,461	26,199	1,738	7%	1,969
<b>Total</b>	<b>70,817</b>	<b>75,101</b>	<b>4,284</b>	<b>6%</b>	<b>5,567</b>

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<sup>1</sup> 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**—Entry-level wages for computer and web programming occupations in the region are between \$17.48 and \$32.25. Entry-level wages for these occupations are higher than the MIT Living hourly wage for one adult in the region (\$13.54 in Los Angeles County and \$15.31 in Orange County). Experienced workers earn between \$58.99 and \$84.04, which is higher than the living wage. Regional wages are below the average statewide wage for this occupation.

**Job Postings**—There were 55,007 online job postings related to computer and web programming listed in the past 12 months. The majority of job postings are for software development engineer, java developer, software developer, .net developer and devops engineer. Top software/programming skills are: JavaScript, SQL, Java, Microsoft C# and Python. The top three employers, by number of job postings, in the region are: CoStar Realty Information, Northrop Grumman and Amazon.

**Educational Attainment**—The BLS lists a Bachelor’s degree as the typical entry-level education for computer programmers and software developer occupations, and an associate degree as the typical entry-level education for web developers. The national-level educational attainment data indicates between 13% and 27% of workers in the field have completed some college or an associate degree, and 50% have attained a Bachelor’s degree. In Los Angeles/Orange County, 96% of job postings request a Bachelor’s degree.

**Community College Supply**—Appendix A shows the three-year average number of awards conferred by community colleges in the related TOP codes: Computer Software Development (0707.00) and Computer Programming (0707.10). The colleges with the most computer programming completions in region are: Mt. San Antonio, Santa Monica and Irvine. During 2018, there were three other related program recommendation requests from regional community colleges.

**Appendix A: Regional community college awards (certificates and degrees), 2014-2017**

TOP Code	Program	College	2014-15 Awards	2015-16 Awards	2016-2017 Awards	3-Year Award Average
0707.00	Computer Software Development	Cypress	-	2	1	1
		Golden West	4	4	7	5
		Orange Coast	8	4	5	6
		Pasadena	-	4	4	3
		Saddleback	3	3	3	3
		<b>Subtotal/Average</b>	<b>15</b>	<b>17</b>	<b>20</b>	<b>17</b>
0707.10	Computer Programming	Cerritos	1	1	1	1
		Coastline	1	3	-	1
		Cypress	19	11	27	19
		East LA	8	4	5	6
		Glendale	3	4	1	3
		Irvine	18	29	16	21
		LA City	-	-	43	14

LA Mission	1	1	2	1
LA Pierce	8	4	5	6
LA Southwest	1	1	2	1
LA Valley	7	12	26	15
Long Beach	1	1	-	1
Mt San Antonio	72	66	68	69
Orange Coast	4	10	29	14
Pasadena	5	6	1	4
Santa Monica	24	29	25	26
<b>Subtotal/Average</b>	<b>173</b>	<b>182</b>	<b>251</b>	<b>202</b>
<b>Total/Average</b>	<b>188</b>	<b>199</b>	<b>271</b>	<b>219</b>

## Appendix B: Occupational demand and wage data by county

### Exhibit 2. Los Angeles County

Occupation (SOC)	2017 Jobs	2022 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings	Median Hourly Earnings	Experienced Hourly Earnings
Software Developers, Applications (15-1132)	17,408	19,775	2,367	14%	1,632	\$28.41	\$51.85	\$76.42
Software Developers, Systems Software (15-1133)	14,528	14,658	130	1%	947	\$31.69	\$58.04	\$85.60
Computer Programmers (15-1131)	7,330	7,008	(322)	(4%)	446	\$26.37	\$40.26	\$62.30
Web Developers (15-1134)	7,091	7,461	370	5%	574	\$17.66	\$27.24	\$58.96
<b>Total</b>	<b>46,356</b>	<b>48,902</b>	<b>2,546</b>	<b>5%</b>	<b>3,598</b>			

**Exhibit 3. Orange County**

<b>Occupation (SOC)</b>	<b>2017 Jobs</b>	<b>2022 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings</b>
Software Developers, Applications (15-1132)	10,137	11,629	1,492	15%	975	\$32.14	\$55.41	\$83.46
Software Developers, Systems Software (15-1133)	8,008	8,238	230	3%	557	\$33.04	\$53.70	\$80.98
Computer Programmers (15-1131)	3,469	3,357	(112)	(3%)	212	\$25.60	\$39.81	\$62.66
Web Developers (15-1134)	2,847	2,976	129	5%	226	\$16.93	\$28.06	\$56.31
<b>Total</b>	<b>24,461</b>	<b>26,199</b>	<b>1,738</b>	<b>7%</b>	<b>1,969</b>			

**Exhibit 4. Los Angeles and Orange Counties**

<b>Occupation (SOC)</b>	<b>2017 Jobs</b>	<b>2022 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings</b>
Software Developers, Applications (15-1132)	27,545	31,403	3,858	14%	2,607	\$29.97	\$53.05	\$79.33
Software Developers, Systems Software (15-1133)	22,535	22,896	361	2%	1,503	\$32.25	\$56.44	\$84.04
Computer Programmers (15-1131)	10,799	10,365	(434)	(4%)	658	\$26.14	\$40.11	\$62.91
Web Developers (15-1134)	9,938	10,437	499	5%	800	\$17.48	\$27.50	\$58.99
<b>Total</b>	<b>70,817</b>	<b>75,101</b>	<b>4,284</b>	<b>6%</b>	<b>5,567</b>			

## Appendix C: Sources

- O\*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (EMSI)
- Employment Development Department, Labor Market Information Division, OES
- Employment Development Department, Unemployment Insurance Dataset
- Living Insight Center for Community Economic Development
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- MIT Living Wage
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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