

Program Endorsement Brief: 0707.30/Computer Systems Analysis Data Science

Los Angeles/Orange County Center of Excellence, October 2020

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some Criteria Met <input type="checkbox"/>	Not Endorsed <input type="checkbox"/>
Program Endorsement Criteria			
Supply Gap:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Living Wage: (Entry-Level, 25th)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Education:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Emerging Occupation(s)			
Yes <input type="checkbox"/>		No <input checked="" type="checkbox"/>	

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 two middle-skill occupations: *computer user support specialists* (15-1151), and *computer network support specialists* (15-1152). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree,¹ and are highlighted in this report to show which data science occupations are immediately accessible to community college-level award earners. However, the field of data science is comprised of many occupations that typically require workers to obtain a bachelor's degree. Therefore, above middle-skill occupations are included in this report to illuminate a pathway for students who continue their education past the community college level. The above middle-skill data science occupations in this report include *computer systems analysts* (15-1121), *information security analysts* (15-1122) and *operations research analysts* (15-2031).

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. While demand data for above middle-skill data science occupations are included in this report, the program endorsement only takes into account the middle-skill data science occupations when considering the local supply and demand.

Based on the available data, there appears to be a supply gap for these middle-skill data science occupations in the region. Furthermore, all of the annual openings for these occupations typically require an associate degree or some college, and entry-level wages exceed the living

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.

wage in both Los Angeles and Orange counties. **Therefore, due to all 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 **3,333 jobs available annually** in the region due to new job growth and replacements, **which is more than the 634 awards conferred annually** by educational institutions in the region.
- **Living Wage Criteria** –Within Los Angeles County, **all of the annual job openings** for these middle-skill data science occupations have **entry-level wages above the California Family Needs Calculator living wage** (\$15.04/hour).²
- **Educational Criteria** –Within the LA/OC region, **all of the annual job openings** for these middle-skill data science occupations **typically require an associate degree or some college.**
 - Furthermore, the national-level educational attainment data indicates **41% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **17 community colleges** in the LA/OC region that issue awards related to data science, conferring an average of **129 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **505 awards conferred annually** in related training programs by non-community college institutions throughout the region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these middle-skill data science occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 6% through 2024. There will be more than 3,300 job openings per year through 2024 due to job growth and replacements.

Exhibit 1: Middle-skill occupational demand in Los Angeles and Orange Counties³

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	24,121	25,603	1,482	6%	2,333
Orange	10,239	10,901	662	6%	999
Total	34,360	36,505	2,145	6%	3,333

Exhibit 2 shows the five-year occupational demand projections for the above middle-skill group of data science occupations. In Los Angeles/Orange County, the number of jobs related to these

² Living wage data was pulled from California Family Needs Calculator on 10/2/20. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

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.

occupations is projected to increase by 7% through 2024. There will be more than 2,300 job openings per year through 2024 due to retirements and workers leaving the field.

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 2: Above middle-skill occupational demand in Los Angeles and Orange Counties

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	18,271	19,489	1,218	7%	1,581
Orange	8,533	9,190	657	8%	760
Total	26,804	28,679	1,875	7%	2,341

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these data science occupations in Los Angeles County 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—All of the annual openings for these data science occupations have entry-level wages above the living wage for one adult (\$15.04 in Los Angeles County).⁴ For the middle-skill occupations, typical entry-level hourly wages are in a range between \$21.25 and \$25.56. For the above middle-skill occupations, typical entry-level hourly wages are in a range between \$32.59 and \$36.27. Experienced workers can expect to earn wages between \$34.98 and \$61.08, which are higher than the living wage estimate. Los Angeles County's average wages are below the average statewide wage of \$41.15 for these occupations.

Orange County—All of the annual openings for these data science occupations have entry-level wages above the living wage for one adult (\$17.36 in Los Angeles County).⁵ For the middle-skill occupations, typical entry-level hourly wages are in a range between \$20.69 and \$24.89. For the above middle-skill occupations, typical entry-level hourly wages are in a range between \$31.27 and \$34.84. Experienced workers can expect to earn wages between \$53.87 and \$58.67, which are higher than the living wage estimate. Orange County's average wages are below the average statewide wage of \$41.15 for these occupations.

⁴ Living wage data was pulled from California Family Needs Calculator on 10/2/2020. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

⁵ Living wage data was pulled from California Family Needs Calculator on 10/2/2020. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

Job Postings

There were 10,945 online job postings related to middle-skill data science occupations listed in the past 12 months. The highest number of job postings were for help desk analysts, desktop support, desktop support technicians, help desk technicians, and IT support specialists. The top skills were: technical support, customer service, help desk support, repair, and Microsoft Active Directory. The top three employers, by number of job postings, in the region were: Best Buy, IBM and Northrop Grumman.

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

The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for these data science occupations:

- **Bachelor's degree:** Computer Systems Analysts, Information Security Analysts, and Operations Research Analysts
- **Associate degree:** Computer Network Support Specialists
- **Some college/no degree:** Computer User Support Specialists

In the LA/OC region, all of the annual job openings for these middle-skill data science occupations typically require an associate degree or some college. Furthermore, the national-level educational attainment data indicates 41% of workers in the field have completed some college or an associate degree. Of the 26% of middle-skill data science job postings listing a minimum education requirement in Los Angeles/Orange County, 72% (2,044) requested a high school diploma and 28% (812) requested an associate degree.

Educational Supply

Community College Supply—Exhibit 3 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Computer Information Systems (0702.00) and Computer Systems Analysis (0707.30). The colleges with the most completions in the region are Rio Hondo, East LA, El Comino and LA Trade-Tech. Over the past 12 months, there were six other related program recommendation requests from regional community colleges.

Exhibit 3: 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

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		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
0707.30	Computer Systems Analysis	Cerritos	6	4	2	4
		LA Subtotal	6	4	2	4
		Cypress	-	5	2	2
		OC Subtotal	0	5	2	2
Supply Subtotal/Average			6	9	4	6
Supply Total/Average			129	142	117	129

Exhibit 4 displays the Strong Workforce Program (SWP) metrics for the Computer Systems Analysis (0707.30) programs in the region.

Exhibit 4: Strong Workforce Program metrics for LA/OC Computer Systems Analysis (0707.30) programs

Strong Workforce Program Metrics (2017-18, unless noted otherwise)	Los Angeles/Orange County	California
Unduplicated count of enrolled students (2018-19)	201	1,153
Median annual earnings	\$36,080	\$32,354
Median change in earnings	24%	30%
Students who attained the living wage	56%	58%
Job closely related to field of study (2016-17)	67%	63%

Non-Community College Supply—It is important to consider the supply from other institutions in the region that provide training programs for data science. Exhibit 5 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Information Technology (11.0103), Computer Systems Analysis/Analyst (11.0501), and Computer Technology/Computer Systems Technology (15.1202). 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 505 awards annually in related training programs.

Exhibit 5: 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	-	0
		Bethesda University	1	1	-	1
		Brand College	55	42	28	42
		California Intercontinental University	-	-	1	0
		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
11.0501	Computer Systems Analysis/Analyst	Brand College	1	2	4	2
		DeVry University-California	110	103	94	102
		University of Phoenix-California	9	8	4	7
15.1202	Computer Technology/Computer Systems Technology	Advanced Computing Institute	67	74	92	78
		Learnet Academy Inc	-	13	11	8
Supply Total/Average			521	485	509	505

Appendix A: Occupational demand and wage data by county

Exhibit 5. 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 User Support Specialists (15-1151)	19,263	20,531	1,268	7%	1,884	\$21.25	\$27.19	\$34.98
Computer Network Support Specialists (15-1152)	4,858	5,072	214	4%	450	\$25.56	\$32.71	\$42.68
Middle-Skill Subtotal	24,121	25,603	1,482	6%	2,333			
Computer Systems Analysts (15-1121)	13,806	14,467	661	5%	1,151	\$34.26	\$45.60	\$58.38
Information Security Analysts (15-1122)	1,816	2,085	269	15%	191	\$36.27	\$48.91	\$61.08
Operations Research Analysts (15-2031)	2,649	2,937	288	11%	239	\$32.59	\$43.85	\$56.16
Above Middle-Skill Subtotal	18,271	19,489	1,218	7%	1,581			
Total	42,392	45,092	2,700	6%	3,915			

Exhibit 6. 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 User Support Specialists (15-1151)	8,258	8,832	574	7%	815	\$20.69	\$26.49	\$34.10
Computer Network Support Specialists (15-1152)	1,980	2,069	89	4%	184	\$24.89	\$31.88	\$41.64
Middle-Skill Subtotal	10,239	10,901	662	6%	999			
Computer Systems Analysts (15-1121)	6,472	6,841	369	6%	554	\$33.08	\$43.99	\$56.30
Information Security Analysts (15-1122)	862	1,013	151	18%	96	\$34.84	\$46.98	\$58.67
Operations Research Analysts (15-2031)	1,200	1,336	136	11%	109	\$31.27	\$42.07	\$53.87
Above Middle-Skill Subtotal	8,533	9,190	657	8%	760			
Total	18,772	20,092	1,320	7%	1,759			

Exhibit 7. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education	On-The-Job Training & Work Experience
Computer User Support Specialists (15-1151)	27,521	29,363	1,842	7%	2,699	Some college/ no degree	None & None
Computer Network Support Specialists (15-1152)	6,838	7,141	303	4%	634	Associate degree	None & None
Middle-Skill Subtotal	34,360	36,505	2,145	6%	3,333		
Computer Systems Analysts (15-1121)	20,277	21,308	1,031	5%	1,705	Bachelor's degree	None & None
Information Security Analysts (15-1122)	2,678	3,098	420	16%	288	Bachelor's degree	None & Less than 5 Years
Operations Research Analysts (15-2031)	3,849	4,273	424	11%	348	Bachelor's degree	None & None
Above Middle-Skill Subtotal	26,804	28,679	1,875	7%	2,341		
Total	61,164	65,184	4,020	7%	5,673		

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)

For more information, please contact:

Luke Meyer, Director
 Los Angeles/Orange County Center of Excellence
lmeyer7@mtsac.edu

October 2020

