**Labor Market Analysis: 0702.00 – Computer Information Systems**
*Data Science - Certificate requiring 16 to fewer than 30 semester units*
**0702.10 Software Applications**
*Data Analytics - Certificates requiring 16 to fewer than 30 semester units*
Los Angeles Center of Excellence, December 2023

## Summary

| 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 Center of Excellence for Labor Market Research (LA COE) prepared this report to provide regional labor market supply and demand data related to four data science and analytics occupations:

- *Computer Systems Analysts* **(15-1211)** Analyze science, engineering, business, and other data processing problems to develop and implement solutions to complex applications problems, system administration issues, or network concerns. Perform systems management and integration functions, improve existing computer systems, and review computer system capabilities, workflow, and schedule limitations. May analyze or recommend commercially available software;[1]

- *Database Administrators* **(15-1242)** Administer, test, and implement computer databases, applying knowledge of database management systems. Coordinate changes to computer databases. Identify, investigate, and resolve database performance issues, database capacity, and database scalability. May plan, coordinate, and implement security measures to safeguard computer databases;[2]

- *Database Architects* **(15-1241)** Design strategies for enterprise databases, data warehouse systems, and multidimensional networks. Set standards for database operations, programming, query processes, and security. Model, design, and construct large relational databases or data warehouses. Create and optimize data models for warehouse infrastructure and workflow. Integrate new systems with existing warehouse structure and refine system performance and functionality;[3]

- *Data Scientists* **(15-2051)** Develop and implement a set of techniques or analytics applications to transform raw data into meaningful information using data-oriented

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[1] Computer Systems Analysts (bls.gov)
[2] Database Administrators and Architects (bls.gov)
[3] Database Administrators and Architects (bls.gov)

programming languages and visualization software. Apply data mining, data modeling, natural language processing, and machine learning to extract and analyze information from large structured and unstructured datasets. Visualize, interpret, and report data findings. May create dynamic data reports;[4]

and one emerging occupation:

- **Business Intelligence Analysts (15-2051.01)** Produce financial and market intelligence by querying data repositories and generating periodic reports. Devise methods for identifying data patterns and trends in available information sources.[5]

Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.[6] While the occupations in this report typically require a bachelor's degree and are considered above middle-skill, they are included because they most closely align with the proposed program and illuminate a pathway for students who want to continue their education past the community college level. 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 data science occupations in the region. While entry-level wages exceed the self-sufficiency standard wage in both Los Angeles and Orange counties, the Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for these data science occupations. **Therefore, due to some the criteria being met, the LA COE endorses this proposed program.** Detailed reasons include:

**Demand:**

- *Supply Gap Criteria –* Over the next five years, **2,156 jobs are projected to be available annually** in the region due to new job growth and replacements, **which is more than the three-year average of 1,968 awards conferred** by educational institutions in the region.
- *Living Wage Criteria –* Within Los Angeles County, all four occupations have **entry-level wages <u>above</u> the self-sufficiency standard hourly wage** ($18.10/hour).[7]
- *Educational Criteria –* The Bureau of Labor Statistics (BLS) lists a **bachelor's degree** as the **typical entry-level education for these data science occupations.**

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[4] Data Scientists (bls.gov)
[5] Business Intelligence Analysts (onetonline.org)
[6] 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.
[7] Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: http://selfsufficiencystandard.org/california.

- The national-level educational attainment data indicates between 14% and 26% of workers in the field have completed an associate degree or less education, while the **majority of workers in the field (74% - 86%) have completed a bachelor's degree or more education.**

## Supply:

- There are **27 community colleges** in the greater LA/OC region that issue awards related to data science, conferring an average of **1,029 awards annually** between 2019 and 2022.
- Between 2019 and 2021, there was an average of **939 awards conferred annually** in related training programs by non-community college institutions throughout the greater LA/OC region.

## Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these data science occupations. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to increase by 9% through 2027. There will be more than 2,100 job openings per year through 2027 due to job growth and replacements.

**Exhibit 1: Occupational demand in Los Angeles and Orange Counties[8]**

| Geography | 2022 Jobs | 2027 Jobs | 2022-2027 Change | 2022-2027 % Change | Annual Openings |
|---|---|---|---|---|---|
| Los Angeles | 19,141 | 20,768 | 1,627 | 9% | 1,481 |
| Orange | 8,526 | 9,317 | 790 | 9% | 675 |
| **Total** | **27,667** | **30,085** | **2,417** | **9%** | **2,156** |

### 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 self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater LA/OC region. Detailed wage information, by county, is included in Appendix A.

### Los Angeles County

All four occupations in this report have entry-level wages <u>above</u> the self-sufficiency standard wage for one adult ($18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between $36.08 and $51.31, while experienced workers can expect to earn wages between $65.34 and $81.82.

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

**Exhibit 2: Earnings for Occupations in LA County**

| Occupation | Entry-Level Hourly Earnings (25th Percentile) | Median Hourly Earnings | Experienced Hourly Earnings (75th Percentile) | Median Annual Earnings* |
|---|---|---|---|---|
| Computer Systems Analysts (15-1211) | $41.67 | $53.67 | $67.11 | $111,600 |
| Database Administrators (15-1242) | $36.08 | $49.57 | $65.34 | $103,100 |
| Database Architects (15-1243) | $51.31 | $65.73 | $81.82 | $136,700 |
| Data Scientists (15-2051) | $36.35 | $50.07 | $72.04 | $104,100 |

*Rounded to the nearest $100

## Orange County

All four occupations in this report have entry-level wages <u>above</u> the self-sufficiency standard wage for one adult ($20.63 in Orange County). Typical entry-level hourly wages are in a range between $34.90 and $50.01, while experienced workers can expect to earn wages between $63.21 and $79.67.

**Exhibit 3: Earnings for Occupations in Orange County**

| Occupation | Entry-Level Hourly Earnings (25th Percentile) | Median Hourly Earnings | Experienced Hourly Earnings (75th Percentile) | Median Annual Earnings* |
|---|---|---|---|---|
| Computer Systems Analysts (15-1211) | $40.54 | $52.18 | $65.25 | $108,500 |
| Database Administrators (15-1242) | $34.90 | $47.95 | $63.21 | $99,700 |
| Database Architects (15-1243) | $50.01 | $64.03 | $79.67 | $133,200 |
| Data Scientists (15-2051) | $34.95 | $48.12 | $69.20 | $100,100 |

*Rounded to the nearest $100

On average, the entry-level earnings for the occupations in this report are $40.96; this is above the living wage for one single adult in Los Angeles County ($18.10). Exhibit 4 shows the average wage for the occupations in this report, from entry-level to experienced workers.

**Exhibit 4: Average Hourly Earnings for Data Science Occupations in LA/OC**
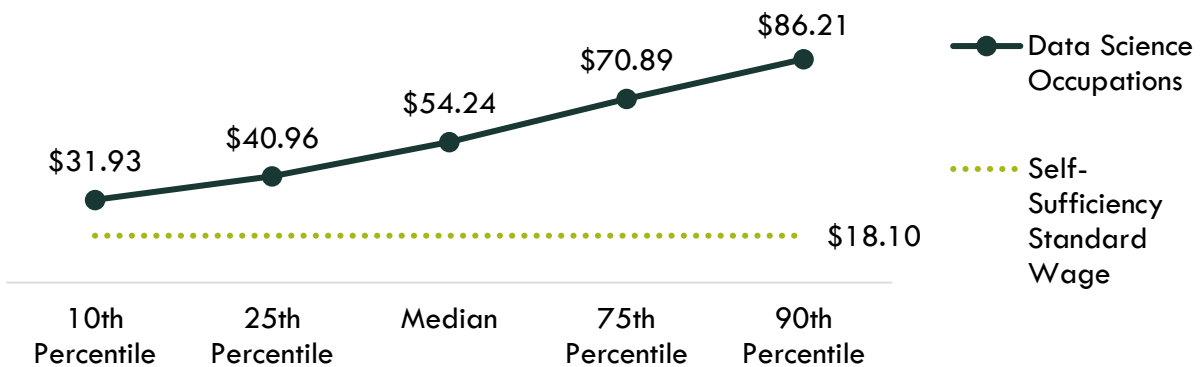
**Job Postings**
Over the past 12 months, there were 15,557 online job postings for these data science occupations. Exhibit 5 displays the number of job postings by occupation. The majority of job postings (39%) were for *computer systems analysts,* followed by *business intelligence analysts* (28%) and *database administrators* (20%). The highest number of job postings were for data analysts, data engineers, business systems analysts, data scientists, and systems analysts. The top skills were SQL programming language, data analysis, computer science, Python programming language, and project ma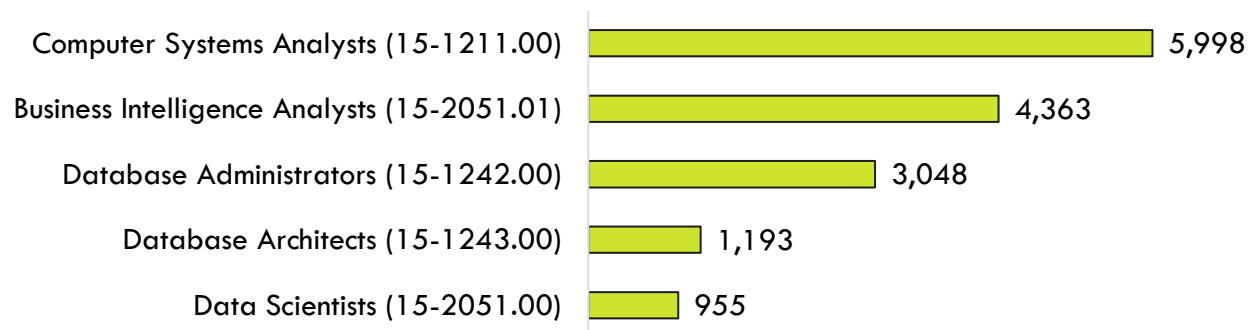nagement. The top three employers, by number of job postings, in the region were Motion Recruitment, UnitedHealth Group, and Randstad.

**Exhibit 5: Job postings by occupation (last 12 months)**

| Occupation | Job Postings |
|---|---|
| Computer Systems Analysts (15-1211.00) | 5,998 |
| Business Intelligence Analysts (15-2051.01) | 4,363 |
| Database Administrators (15-1242.00) | 3,048 |
| Database Architects (15-1243.00) | 1,193 |
| Data Scientists (15-2051.00) | 955 |

**Educational Attainment**
The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for each of the occupations in this report. The national-level educational attainment data indicates between 14% and 26% of workers in the field have completed an associate degree or less education, while the majority of workers in the field (74% - 86%) have completed a bachelor's degree or more education. Of the 65% of data science job postings listing a minimum education requirement in the greater Los Angeles/Orange County region, 9% (914) requested high school or vocational training, 4% (441) requested an associate degree, and 87% (8,766) requested a bachelor's degree.

## Educational Supply
**Community College Supply**
Exhibit 6 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are Long Beach, Mt. San Antonio, and Cypress.

**Exhibit 6: Regional community college awards (certificates and degrees), 2019-2022**

| TOP | Program | College | 2019-20 Awards | 2020-21 Awards | 2021-22 Awards | 3-Year Average |
|---|---|---|---|---|---|---|
| 0509.70 | E-Commerce (business emphasis) | Long Beach | 4 | 7 | 5 | 5 |
| | | **LA Subtotal** | **4** | **7** | **5** | **5** |
| | **Supply Subtotal/Average** | | **4** | **7** | **5** | **5** |

| TOP | Program | College | 2019-20 Awards | 2020-21 Awards | 2021-22 Awards | 3-Year Average |
|---|---|---|---|---|---|---|
| 0701.00 | Information Technology, General | East LA | 10 | 4 | 30 | 15 |
| | | Glendale | - | 3 | 17 | 7 |
| | | LA Harbor | - | 1 | 2 | 1 |
| | | LA Mission | 3 | 1 | 4 | 3 |
| | | LA Southwest | - | 2 | 12 | 5 |
| | | Long Beach | 64 | 106 | 88 | 86 |
| | | Mt San Antonio | 90 | 49 | 23 | 54 |
| | | Santa Monica | - | 1 | - | 0 |
| | | West LA | 5 | - | 6 | 4 |
| | | **LA Subtotal** | **172** | **167** | **182** | **174** |
| | | Santa Ana | - | 3 | 9 | 4 |
| | | **OC Subtotal** | **-** | **3** | **9** | **4** |
| | **Supply Subtotal/Average** | | **172** | **170** | **191** | **178** |
| 0702.00 | Computer Information Systems | Citrus | 8 | 4 | 6 | 6 |
| | | Compton | - | - | 12 | 4 |
| | | East LA | 15 | 23 | 11 | 16 |
| | | El Camino | 21 | 11 | 28 | 20 |
| | | Glendale | 5 | 6 | 8 | 6 |
| | | LA City | 1 | 4 | 3 | 3 |
| | | LA Harbor | - | - | 1 | 0 |
| | | LA Mission | 1 | 1 | 1 | 1 |
| | | LA Southwest | - | - | 21 | 7 |
| | | LA Trade-Tech | 20 | 15 | 17 | 17 |
| | | Long Beach | - | 3 | - | 1 |
| | | Mt San Antonio | 79 | 6 | 68 | 51 |
| | | Rio Hondo | 10 | 6 | 15 | 10 |
| | | West LA | 10 | 9 | 14 | 11 |
| | | **LA Subtotal** | **170** | **88** | **205** | **154** |
| | | Coastline | - | - | 2 | 1 |
| | | Cypress | 4 | - | - | 1 |
| | | Fullerton | 11 | 31 | 49 | 30 |
| | | Irvine | 2 | - | - | 1 |
| | | Orange Coast | 2 | - | 1 | 1 |
| | | Saddleback | - | 1 | - | 0 |
| | | Santa Ana | 2 | 16 | 18 | 12 |

| TOP | Program | College | 2019-20 Awards | 2020-21 Awards | 2021-22 Awards | 3-Year Average |
|---|---|---|---|---|---|---|
| | | Santiago Canyon | 4 | 1 | 1 | 2 |
| | | **OC Subtotal** | **25** | **49** | **71** | **48** |
| | **Supply Subtotal/Average** | | **195** | **137** | **276** | **203** |
| 0702.10 | Software Applications | Cerritos | 6 | 2 | 8 | 5 |
| | | LA City | 1 | 1 | - | 1 |
| | | LA Mission | - | 3 | - | 1 |
| | | LA Southwest | - | - | 3 | 1 |
| | | Long Beach | 7 | - | - | 2 |
| | | Mt San Antonio | 2 | - | 1 | 1 |
| | | Santa Monica | 13 | 6 | 12 | 10 |
| | | **LA Subtotal** | **29** | **12** | **24** | **22** |
| | | Coastline | 8 | 8 | 14 | 10 |
| | | Cypress | - | - | 2 | 1 |
| | | Irvine | 48 | 50 | 89 | 62 |
| | | Saddleback | 7 | 11 | 10 | 9 |
| | | **OC Subtotal** | **63** | **69** | **115** | **82** |
| | **Supply Subtotal/Average** | | **92** | **81** | **139** | **104** |
| 0707.20 | Database Design and Administration | Citrus | 1 | - | 1 | 1 |
| | | Long Beach | 1 | 13 | 11 | 8 |
| | | Mt San Antonio | 12 | 8 | 16 | 12 |
| | | Pasadena | 4 | 24 | 14 | 14 |
| | | Santa Monica | 5 | 2 | 4 | 4 |
| | | **LA Subtotal** | **23** | **47** | **46** | **39** |
| | | Santa Ana | 8 | 2 | 2 | 4 |
| | | **OC Subtotal** | **8** | **2** | **2** | **4** |
| | **Supply Subtotal/Average** | | **31** | **49** | **48** | **43** |
| 0707.30 | Computer Systems Analysis | Cerritos | 3 | - | 5 | 3 |
| | | East LA | 1 | - | - | 0 |
| | | LA City | - | 1 | 6 | 2 |
| | | LA Harbor | - | 1 | 1 | 1 |
| | | LA Mission | 1 | 1 | 1 | 1 |
| | | LA Pierce | - | 6 | 5 | 4 |
| | | Mt San Antonio | - | - | 9 | 3 |
| | | Rio Hondo | - | - | 3 | 1 |
| | | **LA Subtotal** | **5** | **9** | **30** | **15** |

| TOP | Program | College | 2019-20 Awards | 2020-21 Awards | 2021-22 Awards | 3-Year Average |
|---|---|---|---|---|---|---|
| | | **Supply Subtotal/Average** | **5** | **9** | **30** | **15** |
| 0708.10 | Computer Networking | Cerritos | 9 | 8 | 6 | 8 |
| | | Glendale | 3 | - | 2 | 2 |
| | | LA City | - | 4 | 8 | 4 |
| | | LA Pierce | 20 | 12 | 19 | 17 |
| | | Long Beach | 47 | 48 | 52 | 49 |
| | | Mt San Antonio | 11 | 4 | 25 | 13 |
| | | Rio Hondo | 7 | 2 | 5 | 5 |
| | | West LA | 48 | 58 | 24 | 43 |
| | | **LA Subtotal** | **145** | **136** | **141** | **141** |
| | | Coastline | 59 | 92 | 49 | 67 |
| | | Cypress | 95 | 61 | 71 | 76 |
| | | Fullerton | - | 1 | - | 0 |
| | | Irvine | 21 | 10 | 18 | 16 |
| | | Saddleback | 21 | 19 | 15 | 18 |
| | | Santa Ana | 12 | 23 | 45 | 27 |
| | | **OC Subtotal** | **208** | **206** | **198** | **204** |
| | | **Supply Subtotal/Average** | **353** | **342** | **339** | **345** |
| 0708.20 | Computer Support | Citrus | 1 | 1 | 4 | 2 |
| | | Glendale | 7 | 2 | 7 | 5 |
| | | LA Pierce | 8 | 6 | 6 | 7 |
| | | LA Valley | - | 1 | - | 0 |
| | | Long Beach | 14 | 40 | 33 | 29 |
| | | Pasadena | 30 | 34 | 12 | 25 |
| | | **LA Subtotal** | **60** | **84** | **62** | **69** |
| | | Cypress | 5 | 3 | 13 | 7 |
| | | **OC Subtotal** | **5** | **3** | **13** | **7** |
| | | **Supply Subtotal/Average** | **65** | **87** | **75** | **76** |
| 0709.00 | World Wide Web Administration | Cerritos | - | - | 3 | 1 |
| | | Glendale | 7 | 10 | 7 | 8 |
| | | LA Pierce | - | 2 | - | 1 |
| | | Long Beach | 24 | 34 | 44 | 34 |
| | | Santa Monica | - | 16 | - | 5 |
| | | West LA | 9 | 6 | 7 | 7 |
| | | **LA Subtotal** | **40** | **68** | **61** | **56** |

| TOP | Program | College | 2019-20 Awards | 2020-21 Awards | 2021-22 Awards | 3-Year Average |
|---|---|---|---|---|---|---|
| | | Fullerton | - | 1 | - | 0 |
| | | Saddleback | 2 | 2 | 3 | 2 |
| | | **OC Subtotal** | **2** | **3** | **3** | **8** |
| | | **Supply Subtotal/Average** | **42** | **71** | **64** | **59** |
| 0709.10 | E-Commerce (technology emphasis) | East LA | 1 | 1 | 2 | 1 |
| | | **LA Subtotal** | **1** | **1** | **2** | **1** |
| | | Saddleback | 1 | - | 2 | 1 |
| | | **OC Subtotal** | **1** | **-** | **2** | **1** |
| | | **Supply Subtotal/Average** | **2** | **1** | **4** | **2** |
| | | **Supply Total/Average** | **961** | **954** | **1,171** | **1,029** |

**Non-Community College Supply**

For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for data science occupations. Exhibit 7 shows the annual and three-year average number of awards conferred by these institutions in relevant programs. Due to different data collection periods, the most recent three-year period of available data is from 2019 to 2021. Between 2019 and 2021, non-community college institutions in the region conferred an average of 939 bachelor's and sub-baccalaureate awards. Of the awards listed in Exhibit 7, the majority (68%) are bachelor's awards, while 32% are sub-baccalaureate awards. Bachelor's awards are included, since these data science occupations typically require a bachelor's degree. Sub-baccalaureate awards include associate degrees, postsecondary awards, and other academic awards.

**Exhibit 7: Regional non-community college awards, 2019-2021**

| CIP | Program | Institution | 2019-20 Awards | 2020-21 Awards | 2-Year Average |
|---|---|---|---|---|---|
| 11.0101 | Computer and Information Sciences, General | Azusa Pacific Univ. | 21 | 25 | 23 |
| | | Chapman Univ. | 18 | 23 | 21 |
| | | LA Pacific College | 6 | 2 | 4 |
| | | Loyola Marymount Univ. | 27 | 45 | 36 |
| | | Pitzer College | - | 1 | 1 |
| | | UC-Irvine | - | 1 | 1 |
| | | Univ. of La Verne | 23 | 36 | 30 |
| | | Univ. of Massachusetts Global | 30 | 36 | 33 |
| | | University of the People | 203 | 292 | 248 |
| 11.0103 | Information Technology | Brand College | 13 | 17 | 15 |
| | | CA Intercontinental Univ. | 2 | - | 1 |

| CIP | Program | Institution | 2019-20 Awards | 2020-21 Awards | 2-Year Average |
|---|---|---|---|---|---|
| | | CSU-Dominguez Hills | 4 | 10 | 7 |
| | | CSU-Los Angeles | 166 | 116 | 141 |
| | | CSU-Northridge | 29 | 51 | 40 |
| | | Platt College-Anaheim | 15 | 17 | 16 |
| | | Platt College-LA | 12 | 6 | 9 |
| | | University of La Verne | 2 | 3 | 3 |
| 11.0199 | Computer and Information Sciences, Other | CSU-Dominguez Hills | 65 | 55 | 60 |
| | | CSU-Northridge | 73 | 99 | 86 |
| 11.0801 | Web Page, Digital/Multimedia and Information Resources Design | LA Pacific College | - | 4 | 2 |
| 11.0802 | Data Modeling/ Warehousing and Database Administration | ABCO Technology | 15 | 21 | 18 |
| 11.0899 | Computer Software and Media Applications, Other | Art Center College of Design | 20 | 14 | 17 |
| | | CA Institute of the Arts | 8 | 1 | 5 |
| | | Learnet Academy | 10 | 9 | 10 |
| 11.0901 | Computer Systems Networking and Telecommunications | Brand College | 2 | - | 1 |
| 11.1001 | Network and System Administration/ Administrator | ABCO Technology | 25 | 40 | 33 |
| | | Brand College | 9 | 16 | 13 |
| | | CA Intercontinental Univ. | 1 | 1 | 1 |
| 11.1003 | Computer and Information Systems Security/Auditing/ Information Assurance | Learnet Academy | 5 | 4 | 5 |
| 11.1004 | Web/Multimedia Management and Webmaster | ABCO Technology | 37 | 35 | 36 |
| | | LA Pacific College | 1 | 1 | 1 |
| 11.1006 | Computer Support Specialist | Southern California Institute of Technology | 26 | 17 | 22 |
| 15.1202 | Computer/ Computer Systems Technology/Technician | Learnet Academy | 4 | 2 | 3 |
| 52.0208 | E-Commerce/ Electronic Commerce | University of La Verne | 4 | 1 | 3 |
| | | **Supply Total/Average** | **876** | **1,001** | **939** |

Exhibit 8 shows the proportion of community college awards conferred in LA/OC compared to the number of non-community college awards for the programs in this report. Just over half of the awards conferred in these programs are awarded by community colleges in the LA/OC region.

**Exhibit 8: Community College Awards Compared to Non-Community College Awards in LA/OC Region, 3-Year Average**
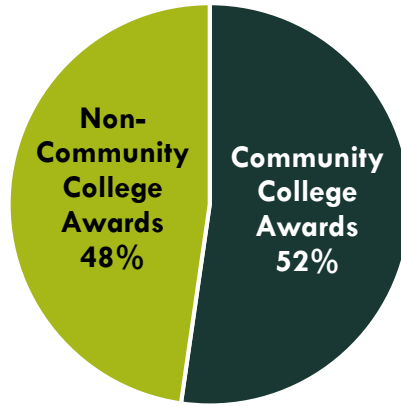


**Appendix A: Occupational demand and wage data by county**

**Exhibit 9. Los Angeles County**

| Occupation (SOC) | 2022 Jobs | 2027 Jobs | 5-Yr Change | 5-Yr % Change | Annual Openings | Entry-Level Hourly Earnings (25th Percentile) | Median Hourly Earnings | Experienced Hourly Earnings (75th Percentile) |
|---|---|---|---|---|---|---|---|---|
| Computer Systems Analysts (15-1211) | 11,271 | 11,888 | 617 | 5% | 794 | $41.67 | $53.67 | $67.11 |
| Database Administrators (15-1242) | 2,002 | 2,109 | 106 | 5% | 138 | $36.08 | $49.57 | $65.34 |
| Database Architects (15-1243) | 862 | 932 | 70 | 8% | 65 | $51.31 | $65.73 | $81.82 |
| Data Scientists (15-2051) | 5,006 | 5,840 | 833 | 17% | 484 | $36.35 | $50.07 | $72.04 |
| **Total** | **19,141** | **20,768** | **1,627** | **9%** | **1,481** | - | - | - |

**Exhibit 10. Orange County**

| Occupation (SOC) | 2022 Jobs | 2027 Jobs | 5-Yr Change | 5-Yr % Change | Annual Openings | Entry-Level Hourly Earnings (25th Percentile) | Median Hourly Earnings | Experienced Hourly Earnings (75th Percentile) |
|---|---|---|---|---|---|---|---|---|
| Computer Systems Analysts (15-1211) | 5,171 | 5,516 | 345 | 7% | 378 | $40.54 | $52.18 | $65.25 |
| Database Administrators (15-1242) | 802 | 850 | 48 | 6% | 57 | $34.90 | $47.95 | $63.21 |
| Database Architects (15-1243) | 403 | 440 | 37 | 9% | 31 | $50.01 | $64.03 | $79.67 |
| Data Scientists (15-2051) | 2,150 | 2,511 | 360 | 17% | 208 | $34.95 | $48.12 | $69.20 |
| **Total** | **8,526** | **9,317** | **790** | **9%** | **675** | **-** | **-** | **-** |

**Exhibit 11. Los Angeles and Orange Counties**

| Occupation (SOC) | 2022 Jobs | 2027 Jobs | 5-Yr Change | 5-Yr % Change | Annual Openings | % Age 55 and older* | Typical Entry-Level Education |
|---|---|---|---|---|---|---|---|
| Computer Systems Analysts (15-1211) | 16,442 | 17,404 | 962 | 6% | 1,172 | 21% | Bachelor's degree |
| Database Administrators (15-1242) | 2,804 | 2,959 | 155 | 6% | 195 | 21% | Bachelor's degree |
| Database Architects (15-1243) | 1,265 | 1,372 | 107 | 8% | 96 | 21% | Bachelor's degree |
| Data Scientists (15-2051) | 7,157 | 8,350 | 1,193 | 17% | 692 | 15% | Bachelor's degree |
| **Total** | **27,667** | **30,085** | **2,417** | **9%** | **2,156** | **-** | **-** |

*The average percentage of workers age 55 and older across all occupations in the greater LA/OC region is 27%. These occupations have a smaller share of older workers, which typically indicates fewer replacements needs to offset the amount of impending retirements.

**Appendix B: Sources**

- O*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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