**Data Analytics Occupations**

**Labor Market Information Report**

**Mission College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

September 2020

# Recommendation

Based on all available data, there appears to be an undersupply of Data Analytics workers compared to the demand for this cluster of occupations in the Bay region and in the Silicon Valley sub-region (Santa Clara County). There is a projected annual gap of about 7,481 students in the Bay region and 2,812 students in the Silicon Valley Sub-Region.

This report also provides student outcomes data on employment and earnings for TOP 0707.30 - Computer Systems Analysis programs in the state and region. It is recommended that these data be reviewed to better understand how outcomes for students taking courses on this TOP code compare to potentially similar programs at colleges in the state and region, as well as to outcomes across all CTE programs at Mission College and in the region.

# Introduction

This report profiles Data Analytics Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at Mission College. Labor market information (LMI) is not available at the eight-digit SOC Code level for Data Warehousing Specialists (15-1199.07), therefore, the data shown in Tables 1 and 2 is for Computer Occupations, All Other (at the six digit SOC level) and likely overstates demand for Data Warehousing Specialists. Tables 3, 4, 6, 9, 10 and 11 use job postings data from Burning Glass at the eight-digit SOC Code level for Data Warehousing Specialists (15-1199.07).

In addition, Mission College selected Computer and Information Research Scientists as one of the occupations their proposed program will prepare students for in the labor market. Labor market data is included for this occupation in Tables 1 and 2 of this report but is excluded from the occupational demand totals in the “Gap Analysis” section of the report, since the occupation requires a Masters degree as the typical entry-level education and therefore community college students completing this program would not be qualified to enter the occupation.

|  |
| --- |
| * **Computer Systems Analysts (15-1121 / 15-1211):** Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software.
 |
| Entry-Level Educational Requirement: Bachelor's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 21% |
|  |
| * **Computer and Information Research Scientists (15-1111 / 15-1221):** Conduct research into fundamental computer and information science as theorists, designers, or inventors. Develop solutions to problems in the field of computer hardware and software.
 |
| Entry-Level Educational Requirement: Master's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 2*%* |
|  |
| * **Computer Occupations, All Other (15-1199 /15-1299):** All computer occupations not listed separately. Excludes “Computer and Information Systems Managers” (11-3021), “Computer Hardware Engineers” (17-2061), “Electrical and Electronics Engineers” (17-2070), “Computer Science Teachers, Postsecondary” (25-1021), “Multimedia Artists and Animators” (27-1014), “Graphic Designers” (27-1024), “Computer Operators” (43-9011), and “Computer, Automated Teller, and Office Machine Repairs” (49-2011).
 |
| Entry-Level Educational Requirement: Bachelor's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 35% |
|  |
| * **Operations Research Analysts (15-2031):** Formulate and apply mathematical modeling and other optimizing methods to develop and interpret information that assists management with decision making, policy formulation, or other managerial functions. May collect and analyze data and develop decision support software, service, or products. May develop and supply optimal time, cost, or logistics networks for program evaluation, review, or implementation.
 |
| Entry-Level Educational Requirement: Bachelor's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 19% |

**Occupational Demand**

**Table 1. Employment Outlook for Data Analytics Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2019 Jobs | 2024 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Computer Systems Analysts |  30,588  |  34,750  | 4,162 | 14% |  15,935  |  3,187  | $44.23 | $56.99 |
| Computer and Information Research Scientists |  4,347  |  5,016  | 669 | 15% |  2,469  |  494  | $54.25 | $73.54 |
| Computer Occupations, All Other |  38,974  |  42,324  | 3,350 | 9% |  19,456  |  3,891  | $41.02 | $56.51 |
| Operations Research Analysts |  3,637  |  4,359  | 721 | 20% |  2,014  |  403  | $36.48 | $51.34 |
| **TOTAL** |  **77,545**  |  **86,448**  | **8,903** | **11%** |  **39,873**  |  **7,975**  | **$42.81** | **$57.41** |

*Source: EMSI 2020.3*

**Bay Region includes** Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties.

**Table 2. Employment Outlook for Data Analytics Occupations in Silicon** **Valley Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2019 Jobs | 2024 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Computer Systems Analysts |  12,180  |  13,860  | 1,680 | 14% |  6,370  |  1,274  | $44.44 | $56.89 |
| Computer and Information Research Scientists |  1,673  |  1,915  | 243 | 15% |  932  |  186  | $65.17 | $79.00 |
| Computer Occupations, All Other |  14,080  |  15,400  | 1,320 | 9% |  7,129  |  1,426  | $47.30 | $64.70 |
| Operations Research Analysts |  991  |  1,195  | 204 | 21% |  557  |  111  | $32.57 | $45.57 |
| **TOTAL** |  **28,924**  |  **32,370**  | **3,446** | **12%** |  **14,988**  |  **2,998**  | **$46.62** | **$61.58** |

*Source: EMSI 2020.3*

**Silicon Valley Sub-Region includes** Santa Clara County.

### Job Postings in Bay Region and Silicon Valley Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (Sept 2019 - Aug 2020)**

| Occupation | Bay Region | Silicon Valley Sub-Region |
| --- | --- | --- |
| Computer Systems Analysts | 16,664 | 6,741 |
| Operations Research Analysts | 10,506 | 2,917 |
| Computer and Information Research Scientists | 6,438 | 2,317 |
| Data Warehousing Specialists | 2,262 | 963 |
| Informatics Nurse Specialists | 13 | 3 |
|  **TOTAL** | **35,883** | **12,941** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Data Analytics Occupations for latest 12 months (Sept 2019 - Aug 2020) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Business Systems Analyst | 3,230 | Information Technology Analyst | 305 |
| Data Scientist | 1,579 | Technical Analyst | 304 |
| Operations Analyst | 1,474 | Scientist | 257 |
| Developer | 1,345 | Oracle Consultant | 233 |
| Systems Analyst | 787 | Data Analyst | 205 |
| Senior Data Scientist | 762 | Information Technology Consultant | 196 |
| Research Associate | 483 | Aem Developer | 195 |
| Technical Consultant | 451 | Research Scientist | 184 |
| Business Development Director | 404 | Mulesoft Developer | 181 |
| Director of Business Development | 373 | Oracle Functional Consultant | 178 |
| Business Analyst | 359 | Computer Scientist | 169 |
| Machine Learning Scientist | 351 | Software Development Engineer | 160 |
| Information Technology Business Analyst | 318 | Operations Specialist | 160 |
| Research Assistant | 315 | React Js Developer | 154 |

**Table 4b. Top Job Titles for Data Analytics Occupations for latest 12 months (Sept 2019 - Aug 2020) Silicon** **Valley Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Silicon Valley | Common Title | Silicon Valley |
| Business Systems Analyst | 1,376 | Information Technology Analyst | 108 |
| Developer | 665 | Technical Analyst | 98 |
| Data Scientist | 502 | Research Scientist | 97 |
| Operations Analyst | 494 | Information Technology Business Analyst | 95 |
| Senior Data Scientist | 267 | Oracle Functional Consultant | 93 |
| Systems Analyst | 251 | Software Development Engineer | 85 |
| Machine Learning Scientist | 187 | Sap Fico | 84 |
| Technical Consultant | 180 | Aem Developer | 82 |
| Business Analyst | 152 | Computer Scientist | 79 |
| Business Development Director | 144 | Sap Functional Analyst | 78 |
| Research Assistant | 130 | Fullstack Developer | 63 |
| Oracle Consultant | 120 | Technical Business Analyst | 62 |
| Data Analyst | 119 | React Js Developer | 61 |
| Director of Business Development | 114 | Mulesoft Developer | 60 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Data Analytics Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2019) | Jobs in Industry (2024) | % Change (2019-24) | % Occupation Group in Industry (2019) |
| Custom Computer Programming Services (541511) | 16,889 | 19,992 | 18% | 22% |
| Computer Systems Design Services (541512) | 9,698 | 10,971 | 13% | 13% |
| Software Publishers (511210) | 4,706 | 5,685 | 21% | 6% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 4,286 | 5,263 | 23% | 6% |
| Data Processing, Hosting, and Related Services (518210) | 3,396 | 4,395 | 29% | 4% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 3,264 | 3,331 | 2% | 4% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 2,810 | 2,725 | -3% | 4% |
| Other Computer Related Services (541519) | 2,407 | 2,960 | 23% | 3% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 2,063 | 2,191 | 6% | 3% |
| Electronic Computer Manufacturing (334111) | 1,702 | 1,788 | 5% | 2% |
| Research and Development in Biotechnology (except Nanobiotechnology) (541714) | 1,277 | 1,634 | 28% | 2% |
| Local Government, Excluding Education and Hospitals (903999) | 1,090 | 1,114 | 2% | 1% |
| Administrative Management and General Management Consulting Services (541611) | 1,029 | 1,237 | 20% | 1% |
| Colleges, Universities, and Professional Schools (State Government) (902612) | 870 | 871 | 0% | 1% |
| Engineering Services (541330) | 816 | 851 | 4% | 1% |
| Temporary Help Services (561320) | 813 | 815 | 0% | 1% |

*Source: EMSI 2020.3*

**Table 6. Top Employers Posting Data Analytics Occupations in Bay Region and Silicon Valley Sub-Region (Sept 2019 - Aug 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Silicon Valley |
| Facebook | 549 | UC San Francisco | 110 | Apple Inc. | 370 |
| Genentech | 517 | Intuit | 108 | Stanford University | 212 |
| Apple Inc. | 372 | Lawrence Berkeley National Laboratory | 106 | Google Inc. | 160 |
| Amazon | 363 | Lawrence Livermore National Laboratory | 96 | Amazon | 150 |
| Wells Fargo | 259 | Salesforce | 95 | IBM | 122 |
| Accenture | 256 | Paypal | 94 | Vmware Incorporated | 104 |
| Stanford University | 250 | Wipro | 86 | Intuit | 95 |
| University California | 232 | Visa | 86 | Accenture | 89 |
| Google Inc. | 218 | Lockheed Martin Corporation | 86 | Paypal | 82 |
| Pacific Gas and Electric Company | 196 | Infobahn Softworld Incorporated | 86 | Lockheed Martin Corporation | 77 |
| University Of California Berkeley | 147 | Cisco Systems Incorporated | 86 | Nvidia Corporation | 76 |
| IBM | 130 | Xoriant Incorporated | 82 | Xoriant Incorporated | 66 |
| Deloitte | 130 | Uber | 81 | Samsung America, Inc. | 62 |
| Thermo Fisher Scientific Inc | 127 | Anthem Blue Cross | 81 | Wipro | 61 |
| Ascent Technology Services | 125 | Infosys | 79 | Cisco Systems Incorporated | 59 |
| Kaiser Permanente | 124 | Nvidia Corporation | 77 | Applied Materials | 52 |
| Vmware Incorporated | 113 | Walmart / Sam's | 76 | Adobe Systems | 50 |

*Source: Burning Glass*

# Educational Supply

There were no community colleges in the Bay Region issuing awards on average annually (last 3 years ending 2018-19) on TOP 0707.30 - Computer Systems Analysis.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 7,481 annual openings for the Data Analytics occupational cluster and no annual (3-year average) awards for an annual undersupply of 7,481 students. There is also a gap in the Silicon Valley sub-region with 2,812 annual openings and no annual (3-year average) awards for an annual undersupply of 2,812 students. For this gap analysis, Computer and Information Research Scientists (one of the occupations Mission College selected) is excluded from the occupational demand totals, since the occupation requires a Masters degree as the typical entry-level education and therefore community college students completing this program would not be qualified to enter the occupation.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0707.30 - Computer Systems Analysis**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2017-18 | **Bay** All CTE Programs | **Mission College** All CTE Programs | **State** 0707.30 | **Bay** 0707.30 | **Silicon Valley** 0707.30 | **Mission College** 0707.30 |
| % Employed Four Quarters After Exit | 74% | 77% | 57% | 59% | n/a | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $10,336 | $8,089 | $13,378 | n/a | n/a |
| Median % Change in Earnings | 46% | 49% | 30% | n/a | n/a | n/a |
| % of Students Earning a Living Wage | 63% | 66% | 58% | n/a | n/a | n/a |

*Source: Launchboard Pipeline (version available on (9/8/20)*

# Skills, Certifications and Education

**Table 9. Top Skills for Data Analytics Occupations in Bay Region (Sept 2019 - Aug 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| SQL | 8,135 | SAP | 2,366 | Information Systems | 1,715 |
| Python | 8,077 | Tableau | 2,297 | Economics | 1,667 |
| Data Science | 6,382 | Customer Service | 2,290 | Data Management | 1,663 |
| Machine Learning | 5,361 | Quality Assurance and Control | 2,267 | Extraction Transformation and Loading (ETL) | 1,659 |
| Project Management | 4,905 | Big Data | 2,258 | Data Warehousing | 1,627 |
| Data Analysis | 4,573 | JavaScript | 2,220 | Product Development | 1,627 |
| Business Process | 4,277 | Salesforce | 2,211 | Enterprise Resource Planning (ERP) | 1,619 |
| Java | 4,152 | Apache Hadoop | 2,079 | Linux | 1,599 |
| Oracle | 3,612 | Budgeting | 1,998 | Data Visualization | 1,525 |
| Business Systems Analysis | 3,562 | Deep Learning | 1,948 | Scrum | 1,486 |
| Experiments | 3,533 | Software Engineering | 1,870 | Physics | 1,470 |
| Business Systems | 3,518 | Scheduling | 1,836 | Biology | 1,466 |
| Software Development | 3,172 | C++ | 1,818 | Biotechnology | 1,345 |
| Business Analysis | 2,854 | Artificial Intelligence | 1,806 | Natural Language Processing | 1,291 |
| Systems Analysis | 2,549 | Business Development | 1,748 | Product Management | 1,276 |

*Source: Burning Glass*

**Table 10. Certifications for Data Analytics Occupations in Bay Region (Sept 2019 - Aug 2020)**

Note: 93% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |
| --- | --- | --- | --- |
| Certification | Postings | Certification | Postings |
| Project Management Certification | 377 | Certified Scrum Professional (CSP) | 40 |
| IT Infrastructure Library (ITIL) Certification | 331 | Certified Animal Laboratory Technician | 31 |
| Driver's License | 324 | Business Analysis Certificate | 30 |
| Security Clearance | 268 | SANS/GIAC Certification | 28 |
| Project Management Professional (PMP) | 189 | Cisco Certified Network Associate (CCNA) | 28 |
| Certified Salesforce Administrator | 99 | Lean Six Sigma Certification | 26 |
| Certified Information Systems Security Professional (CISSP) | 74 | Certified Scrum Trainer (CST) | 25 |
| Six Sigma Certification | 65 | Six Sigma Green Belt Certification | 24 |
| Certified Information Systems Auditor (CISA) | 56 | Microsoft Certified Solutions Expert (MCSE) | 24 |
| SAP Certification | 55 | MBE Certified | 24 |
| Certified Business Analysis Professional (CBAP) | 55 | Certified Salesforce Platform Developer | 24 |
| Certified ScrumMaster (CSM) | 40 | CDL Class C | 23 |

*Source: Burning Glass*

**Table 11. Education Requirements for Data Analytics Occupations in Bay Region**

|  |  |  |
| --- | --- | --- |
| Education (minimum advertised) | Latest 12 Mos. Postings | Percent 12 Mos. Postings |
| High school or vocational training | 420 | 2% |
| Associate Degree | 517 | 2% |
| Bachelor’s Degree or Higher | 15,714 | 96% |

*Source: Burning Glass*

# Methodology

Occupations for this report were identified by use of skills listed in O\*Net descriptions and job descriptions in Burning Glass. Labor demand data is sourced from Economic Modeling Specialists International (EMSI) occupation data and Burning Glass job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CTE Launchboard and CCCCO Data Mart.

# Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard [www.calpassplus.org/Launchboard/](http://www.calpassplus.org/Launchboard/)

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor’s Office MIS system

# Contacts

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