** Database Practitioner Occupations**

**Labor Market Information Report**

**DeAnza College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

October 2019

# Recommendation

Based on all available data, there appears to be an undersupply of Database Practitioner 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 3,432 students in the Bay region and 1,303 students in the Silicon Valley Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0707.20 - Database Design and Administration 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 De Anza College and in the region.

# Introduction

This report profiles Database Practitioner Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at De Anza College. Labor market information (LMI) is not available at the eight-digit SOC Code level for Database Architects (15-1199.06), 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 Database Architects. Tables 3, 4, 6, 9, 10 and 11 use job postings data from Burning Glass at the eight-digit SOC Code level for Database Architects (15-1199.06).

|  |
| --- |
| * **Database Administrators (SOC 15-1141):** Administer, test, and implement computer databases, applying knowledge of database management systems. Coordinate changes to computer databases. May plan, coordinate, and implement security measures to safeguard computer databases. Excludes “Information Security Analysts” (15-1122). |
| Entry-Level Educational Requirement: Bachelor's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 21% |
|  |
| * **Computer Occupations, All Other** (**SOC 15-1199):** 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*%* |

# Occupational Demand

**Table 1. Employment Outlook for Database Practitioner Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Database Administrators | 4,652 | 5,300 | 648 | 14% | 2,216 | 443 | $26.10 | $51.95 |
| Computer Occupations, All Other | 34,129 | 37,296 | 3,168 | 9% | 14,979 | 2,996 | $30.64 | $55.84 |
| **Total** | **38,781** | **42,596** | **3,816** | **10%** | **17,194** | **3,439** | **$30.09** | **$55.38** |

*Source: EMSI 2019.2*

**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 Database Practitioner Occupations in Silicon Valley Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Database Administrators | 1,953 | 2,208 | 255 | 13% | 911 | 182 | $23.26 | $53.49 |
| Computer Occupations, All Other | 12,616 | 13,859 | 1,243 | 10% | 5,615 | 1,123 | $33.63 | $64.58 |
| **TOTAL** | **14,569** | **16,067** | **1,498** | **10%** | **6,526** | **1,305** | **$32.24** | **$63.10** |

*Source: EMSI 2019.2*

**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 (October 2018 - September 2019)**

| Occupation | Bay Region | Silicon Valley |
| --- | --- | --- |
| Database Administrators | 14,586 | 6,528 |
| Database Architects | 3,555 | 1,499 |
| **Total** | **18,141** | **8,027** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Database Practitioner Occupations for latest 12 months (October 2018 - September 2019) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Data Engineer | 3,368 | Hadoop Administrative | 196 |
| Senior Data Engineer | 1,468 | Data Analyst | 154 |
| Data Architect | 1,050 | Database Analyst | 152 |
| Database Administrator | 861 | SQL Database Administrator | 147 |
| ETL Developer | 697 | Lead Data Engineer | 131 |
| SQL Developer | 454 | Data Engineer, Information And Technology Industry | 121 |
| Database Engineer | 393 | Data Manager | 118 |
| Oracle Database Administrator | 373 | Administrator | 112 |
| Informatica Developer | 360 | Hadoop Engineer | 110 |
| Salesforce Administrator | 291 | MySQL Database Administrator | 97 |
| Infrastructure Architect | 267 | Oracle Application Database Administrator | 90 |
| Data Center Technician | 232 | Solutions Architect | 84 |
| Database Developer | 230 | Data Science Engineer | 76 |
| Data Modeler | 208 | Engineer | 75 |

**Table 4b. Top Job Titles for Database Practitioner Occupations for latest 12 months (October 2018 - September 2019) Silicon Valley Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Silicon Valley | Common Title | Silicon Valley |
| Data Engineer | 1,411 | Salesforce Administrator | 74 |
| Senior Data Engineer | 630 | Hadoop Engineer | 68 |
| Data Architect | 454 | Data Engineer, Information And Technology Industry | 64 |
| Database Administrator | 385 | Data Analyst | 62 |
| ETL Developer | 316 | Platform Engineer | 49 |
| Oracle Database Administrator | 199 | MySQL Database Administrator | 49 |
| SQL Developer | 186 | SQL Database Administrator | 47 |
| Database Engineer | 185 | Administrator | 46 |
| Hadoop Administrative | 145 | Engineer | 44 |
| Data Center Technician | 142 | Oracle Application Database Administrator | 43 |
| Database Developer | 99 | Staff Data Engineer | 42 |
| Informatica Developer | 98 | Developer | 40 |
| Infrastructure Architect | 97 | Solutions Architect | 38 |
| Data Modeler | 88 | Data Science Engineer | 37 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Database Practitioner Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2018) | Jobs in Industry (2022) | % Change (2018-22) | % in Industry (2018) |
| Custom Computer Programming Services (541511) | 7,672 | 7,792 | 12% | 20% |
| Computer Systems Design Services (541512) | 4,583 | 4,586 | 8% | 12% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 2,763 | 2,799 | 25% | 7% |
| Software Publishers (511210) | 2,590 | 2,711 | 21% | 7% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 2,092 | 2,085 | -3% | 5% |
| Data Processing, Hosting, and Related Services (518210) | 1,807 | 1,819 | 25% | 5% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 1,579 | 1,556 | 6% | 4% |
| Other Computer Related Services (541519) | 1,102 | 1,119 | 17% | 3% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 677 | 690 | 6% | 2% |
| Electronic Computer Manufacturing (334111) | 588 | 592 | 4% | 2% |
| Temporary Help Services (561320) | 547 | 541 | 5% | 1% |
| Administrative Management and General Management Consulting Services (541611) | 487 | 495 | 19% | 1% |
| Local Government, Excluding Education and Hospitals (903999) | 488 | 491 | 5% | 1% |
| Research and Development in Biotechnology (except Nanobiotechnology) (541714) | 386 | 400 | 31% | 1% |
| Engineering Services (541330) | 379 | 381 | 7% | 1% |

*Source: EMSI 2019.2*

**Table 6. Top Employers Posting Database Practitioner Occupations in Bay Region and Silicon Valley Sub-Region (October 2018 - September 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Silicon Valley |
| Anthem Blue Cross | 136 | Xoriant Incorporated | 36 | Apple Inc. | 111 |
| Facebook | 119 | Oracle | 36 | Cisco Systems Incorporated | 96 |
| Apple Inc. | 112 | Intelliswift Software | 36 | IBM | 67 |
| Amazon | 107 | Cynet Systems | 36 | Google Inc. | 54 |
| Cisco Systems Incorporated | 98 | Stanford University | 34 | Anthem Blue Cross | 47 |
| IBM | 84 | Perficient Incorporated | 34 | Intuit | 39 |
| Scoop Technologies | 70 | Milestone Technologies Incorporated | 34 | Paypal | 37 |
| Google Inc. | 61 | US Government | 32 | Xoriant Incorporated | 34 |
| Techfetch Com | 55 | Akshaya Inc | 32 | Adobe Systems | 34 |
| Wipro | 51 | Ramy Infotech | 30 | Amazon | 32 |
| Microsoft Corporation | 49 | Diverse Lynx | 29 | Stanford University | 31 |
| Accenture | 47 | Bayone Solutions | 29 | Nityo Infotech | 31 |
| Nityo Infotech | 43 | Matchpoint Solutions Incorporated | 28 | Microsoft Corporation | 29 |
| Adobe Systems | 43 | Flexton Incorporated | 28 | Akshaya Inc | 29 |
| Intuit | 42 | Salesforce | 27 | Wipro | 28 |
| Visa | 40 | Target | 26 | Techfetch Com | 28 |
| Paypal | 37 | NTT Data | 26 | Target | 28 |

*Source: Burning Glass*

# Educational Supply

There are two community colleges in the Bay Region issuing seven (7) awards on average annually (last 3 years) on TOP 0707.20 - Database Design and Administration. There is one college in the Silicon Valley Sub-Region (De Anza College) issuing two (2) awards on average annually (last 3 years) on this TOP code.

**Table 7. Awards on TOP 0707.20 - Database Design and Administration in Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| **College** | **Sub-Region** | **Certificate**  **Low unit** | **Total** |
| De Anza College | Silicon Valley | 2 | 2 |
| Ohlone College | East Bay | 5 | 5 |
| **Total Bay Region** | | **7** | **7** |
| **Total Silicon Valley Sub-Region** | | **2** | **2** |

# *Source: Data Mart*

Note: The annual average for awards is 2015-16 to 2017-18.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 3,439 annual openings for the Database Practitioner occupational cluster and 7 annual (3-year average) awards for an annual undersupply of 3,432 students. In the Silicon Valley Sub-Region, there is also a gap with 1,305 annual openings and 2 annual (3-year average) awards for an annual undersupply of 1,303 students.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0707.20 - Database Design and Administration**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay  (All CTE Programs) | DeAnza College (All CTE Programs) | State (0707.20) | Bay (0707.20) | Silicon Valley (0707.20) | DeAnza College (0707.20) |
| % Employed Four Quarters After Exit | 74% | 69% | 68% | 76% | 79% | 78% |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $10,272 | $14,516 | $17,382 | $17,724 | $18,094 |
| Median % Change in Earnings | 46% | 55% | 39% | 47% | 47% | 23% |
| % of Students Earning a Living Wage | 63% | 60% | 74% | 77% | 79% | 78% |

*Source: Launchboard Pipeline (version available on 10/15/19)*

# Skills, Certifications and Education

**Table 9. Top Skills for Database Practitioner Occupations in Bay Region (October 2018 - September 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| SQL | 8,865 | Database Administration | 2,266 | Data Analysis | 1,544 |
| Python | 6,589 | NoSQL | 2,069 | Tableau | 1,524 |
| Extraction Transformation and Loading (ETL) | 5,130 | Data Quality | 1,971 | Apache Webserver | 1,435 |
| Apache Hadoop | 4,937 | UNIX | 1,945 | AWS Redshift | 1,421 |
| Big Data | 4,836 | Software Development | 1,918 | SQL Server | 1,421 |
| Java | 4,778 | Machine Learning | 1,917 | Software Engineering | 1,410 |
| Data Warehousing | 3,889 | Performance tuning | 1,906 | Data Management | 1,403 |
| Oracle | 3,544 | Data Architecture | 1,901 | Teradata DBA | 1,383 |
| Pipeline (Computing) | 3,239 | Informatica | 1,802 | Project Management | 1,299 |
| Apache Hive | 3,220 | Shell Scripting | 1,678 | PostgreSQL | 1,269 |
| Apache Kafka | 3,013 | Data Transformation | 1,642 | Oracle PL/SQL | 1,262 |
| Scala | 2,696 | MySQL | 1,631 | Salesforce | 1,226 |
| Linux | 2,519 | MapReduce | 1,624 | Cassandra | 1,218 |
| Data Modeling | 2,423 | Relational Databases | 1,605 | Data Structures | 1,191 |
| Data Science | 2,400 | Data Engineering | 1,577 | Business Intelligence | 1,152 |

*Source: Burning Glass*

**Table 10. Certifications for Database Practitioner Occupations in Bay Region (October 2018 - September 2019)**

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 |
| Certified Salesforce Administrator | 224 | CompTIA Network+ | 26 |
| Driver's License | 160 | Cisco Certified Internetwork Expert (CCIE) | 25 |
| IT Infrastructure Library (ITIL) Certification | 134 | Certified Administrator | 22 |
| Security Clearance | 101 | Mbe Certified | 20 |
| Cisco Certified Network Associate (CCNA) | 83 | Red Hat Certified Engineer (RHCE) | 19 |
| Project Management Certification | 81 | Certified Information Systems Security Professional (CISSP) | 19 |
| Certified Salesforce Advanced Administrator | 66 | Microsoft Certified Solutions Associate (MCSA) | 18 |
| Oracle Certification | 54 | ITIL Certification | 18 |
| Certified A+ Technician | 50 | Oracle Database Certification | 17 |
| CompTIA Security+ | 45 | Salesforce Platform App Builder | 16 |
| Cisco Certified Network Professional (CCNP) | 33 | Salesforce Developer | 16 |
| Project Management Professional (PMP) | 32 | Certified Salesforce Platform Developer I | 16 |

*Source: Burning Glass*

**Table 11. Education Requirements for Database Practitioner Occupations in Bay Region**

Note: 53% of records have been excluded because they do not include a degree level. As a result, the chart below may not be representative of the full sample.

|  |  |  |
| --- | --- | --- |
| Education (minimum advertised) | Latest 12 Mos. Postings | Percent 12 Mos. Postings |
| High school or vocational training | 320 | 4% |
| Associate Degree | 194 | 2% |
| Bachelor’s Degree or Higher | 7,179 | 94% |

*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

For more information, please contact:

* Doreen O’Donovan, Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (CoE), [doreen@baccc.net](mailto:doreen@baccc.net) or (831) 479-6481
* John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, [jcarrese@ccsf.edu](mailto:jcarrese@ccsf.edu) or (415) 267-6544