** Computer Information** **Systems Occupations**

**Labor Market Information Report**

**Diablo Valley College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

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# Recommendation

Based on all available data, there appears to be a significant undersupply of Computer Information Systems workers compared to the demand for this cluster of occupations in the Bay region and in the East Bay sub-region (Alameda and Contra Costa Counties.) There is a projected annual gap of about 14,407 students in the Bay region and 3,138 students in the East Bay Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0702.00 - Computer Information Systems 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 Diablo Valley College and in the region.

# Introduction

This report profiles Computer Information Systems Occupations in the 12 county Bay region and in the East Bay sub-region for a proposed new program at Diablo Valley College. Labor market information (LMI) is not available at the eight-digit SOC Code level for Information Technology Project Managers (15-1199.09), 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 Information Technology Project Managers. Tables 3, 4, 6, 9, 10 and 11 use job postings data from Burning Glass at the eight-digit SOC Code level for Information Technology Project Managers (15-1199.09).

|  |
| --- |
| * **Secretaries and Administrative Assistants, Except Legal, Medical, and Executive (SOC 43-6014):** Perform routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. Excludes legal, medical, and executive secretaries (43-6011 through 43-6013).
 |
| Entry-Level Educational Requirement: High school *diploma or equivalent* |
| Training Requirement: Short-term *on-the-job training* |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 47% |
|  |
| * **Computer User Support Specialists (SOC 15-1151):** Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, or via telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Excludes “Network and Computer Systems Administrators” (15-1142).
 |
| Entry-Level Educational Requirement: Some *college, no degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 41*%* |
|  |
| * **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*%* |
|  |
| * **Computer Network Support Specialists (SOC 15-1152):** Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption. Excludes “Network and Computer Systems Administrators” (15-1142) and “Computer Network Architects” (15-1143).
 |
| Entry-Level Educational Requirement: Associate's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 41*%* |
|  |
| * **Network and Computer Systems Administrators (SOC 15-1142):** Install, configure, and support an organization’s local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Monitor network to ensure network availability to all system users and may perform necessary maintenance to support network availability. May monitor and test Web site performance to ensure Web sites operate correctly and without interruption. May assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software. May supervise computer user support specialists and computer network support specialists. May administer network security measures. Excludes “Information Security Analysts”(15-1122), “Computer User Support Specialists” (15-1151), and “Computer Network Support Specialists” (15-1152).
 |
| Entry-Level Educational Requirement: Bachelor's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 38*%* |

# Occupational Demand

**Table 1. Employment Outlook for Computer Information Systems Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 66,468 | 67,327 | 859  | 1% | 36,802 | 7,360 | $14.41  | $21.90  |
| Computer User Support Specialists | 29,393 | 34,005 | 4,612  | 16% | 15,944 | 3,189 | $20.02  | $32.70  |
| Computer Occupations, All Other | 19,731 | 21,972 | 2,242  | 11% | 9,101 | 1,820 | $26.99  | $53.32  |
| Computer Network Support Specialists | 6,569 | 7,551 | 982  | 15% | 3,509 | 702 | $22.43  | $37.33  |
| Network and Computer Systems Administrators | 15,623 | 17,418 | 1,795  | 11% | 6,851 | 1,370 | $30.52  | $49.48  |
| **Total** | **137,783** | **148,274** | **10,490**  | **8%** | **72,207** | **14,441** | **$19.62**  | **$32.56**  |

*Source: EMSI 2019.1*

**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 Computer Information Systems Occupations in East Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 18,699 | 18,820 | 121  | 1% | 10,214 | 2,043 | $14.47  | $21.72  |
| Computer User Support Specialists | 5,092 | 5,490 | 398  | 8% | 2,313 | 463 | $19.30  | $29.05  |
| Computer Occupations, All Other | 3,143 | 3,305 | 162  | 5% | 1,248 | 250 | $25.34  | $47.90  |
| Computer Network Support Specialists | 1,833 | 1,936 | 103  | 6% | 785 | 157 | $24.66  | $37.47  |
| Network and Computer Systems Administrators | 3,533 | 3,634 | 101  | 3% | 1,224 | 245 | $27.27  | $49.13  |
| **TOTAL** | **32,300** | **33,184** | **884**  | **3%** | **15,784** | **3,157** | **$18.27**  | **$29.32**  |

*Source: EMSI 2019.1*

**East Bay Sub-Region** includes Alameda and Contra Costa Counties

### Job Postings in Bay Region and East Bay Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (March 2018 - Feb 2019)**

| Occupation | Bay Region | East Bay |
| --- | --- | --- |
|  Secretaries and Administrative Assistants, Except Legal, Medical, and Executive  (43-6014.00) | 22,708 | 6,502 |
|  Information Technology Project Managers (15-1199.09) | 14,862 | 2,496 |
|  Computer User Support Specialists (15-1151.00) | 14,324 | 3,094 |
|  Network and Computer Systems Administrators (15-1142.00) | 7,147 | 1,424 |
|  Computer Network Support Specialists (15-1152.00) | 1,150 | 243 |
| **Total** |  **60,191**  |  **13,759**  |

*Source: Burning Glass*

**Table 4. Top Job Titles for Computer Information Systems Occupations for latest 12 months (March 2018 - Feb 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Common Title | Bay | East Bay | Common Title | Bay | East Bay |
| Administrative Assistant | 12,767 | 3,802 | Administrative Specialist | 440 | 203 |
| Systems Administrator | 1,622 | 325 | Information Technology Specialist | 428 | 123 |
| Technical Project Manager | 1,072 | 184 | Technical Support Specialist | 422 | 113 |
| Desktop Support | 1,018 | 189 | Help Desk Technician | 419 | 128 |
| Information Technology Project Manager | 1,008 | 263 | Technology Manager | 419 | 50 |
| Administrative Coordinator | 910 | 251 | Administrative Associate | 406 | 29 |
| Project Manager | 855 | 156 | Technical Lead | 404 | 72 |
| Information Technology Manager | 843 | 170 | Information Technology Support Specialist | 403 | 79 |
| Front Desk Coordinator | 795 | 190 | Linux Administrator | 379 | 51 |
| Technical Support Engineer | 764 | 84 | Information Technology Technician | 375 | 94 |
| Office Coordinator | 749 | 158 | Network Administrator | 340 | 82 |
| Desktop Support Technician | 508 | 123 | Linux Systems Administrator | 338 | 63 |
| Scrum Master | 498 | 90 | Program Assistant | 329 | 119 |
| Secretary | 463 | 160 | Senior Systems Administrator | 311 | 32 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Computer Information Systems Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2017) | Jobs in Industry (2022) | % Change (2017-22) | % in Industry (2017) |
| Custom Computer Programming Services (541511) | 13,970 | 14,288 | 16% | 10.3% |
| Computer Systems Design Services (541512) | 8,764 | 8,775 | 12% | 6.3% |
| Colleges, Universities, and Professional Schools (State Government) (902612) | 6,243 | 6,452 | 9% | 4.6% |
| Colleges, Universities, and Professional Schools (611310) | 6,311 | 6,400 | 6% | 4.6% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 5,091 | 5,351 | 38% | 3.8% |
| Software Publishers (511210) | 4,564 | 4,814 | 25% | 3.5% |
| Local Government, Excluding Education and Hospitals (903999) | 4,430 | 4,405 | 0% | 3.2% |
| Electronic Computer Manufacturing (334111) | 3,623 | 3,732 | 7% | 2.7% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 3,464 | 3,678 | 10% | 2.6% |
| Elementary and Secondary Schools (Local Government) (903611) | 3,577 | 3,536 | 1% | 2.5% |
| Data Processing, Hosting, and Related Services (518210) | 3,204 | 3,500 | 44% | 2.5% |
| Religious Organizations (813110) | 2,658 | 2,648 |  (3%) | 1.9% |
| Colleges, Universities, and Professional Schools (Local Government) (903612) | 2,554 | 2,413 |  (17%) | 1.7% |
| Temporary Help Services (561320) | 2,361 | 2,338 | 2% | 1.7% |
| Other Computer Related Services (541519) | 1,976 | 2,010 | 20% | 1.4% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 1,805 | 1,779 |  (2%) | 1.3% |
| Offices of Lawyers (541110) | 1,515 | 1,507 |  (3%) | 1.1% |
| Services for the Elderly and Persons with Disabilities (624120) | 1,347 | 1,357 | 20% | 1.0% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 1,296 | 1,349 |  (3%) | 1.0% |
| General Medical and Surgical Hospitals (622110) | 1,355 | 1,340 |  (6%) | 1.0% |

*Source: EMSI 2019.1*

**Table 6. Top Employers Posting Computer Information Systems Occupations in Bay Region and East Bay Sub-Region (March 2018 - Feb 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | East Bay |
| Cisco Systems Incorporated | 364 | Oracle | 107 | UC San Diego | 147 |
| Google Inc. | 349 | University Of California Berkeley | 107 | University California | 103 |
| Best Buy | 311 | Wells Fargo | 105 | Best Buy | 98 |
| Accenture | 254 | Walmart / Sam's | 102 | University Of California Berkeley | 97 |
| Wipro | 234 | Amazon | 95 | Kaiser Permanente | 95 |
| Apple Inc. | 222 | Matchpoint Solutions Inc | 94 | Workday, Inc | 70 |
| Stanford University | 208 | Excell | 91 | Lawrence Livermore National Laboratory | 68 |
| University California | 178 | K Anand Corporation | 91 | Bio-Rad Laboratories | 52 |
| Facebook | 164 | Diverse Lynx | 87 | Contra Costa Community College District | 49 |
| Infosys | 157 | NTT Data | 87 | Tesla Motors | 45 |
| Milestone Technologies Inc | 157 | Techfetch Com | 86 | Accenture | 43 |
| Kaiser Permanente | 156 | Republic Bancorp | 85 | Marriott International Inc | 42 |
| Marriott International Inc | 153 | SAP | 85 | Matchpoint Solutions Inc | 39 |
| Uc San Diego | 150 | Salesforce | 85 | Nana Regional Corp | 37 |
| California State University | 146 | Gap Inc. | 80 | Ross Stores | 37 |
| Deloitte | 144 | Workday, Inc | 76 | Clorox Company | 35 |
| IBM | 134 | US Army | 73 | US Army | 35 |
| Vmware Incorporated | 122 | Charles Schwab | 72 | Pleasanton Unified School District | 34 |
| Macy's | 109 | Dgn Technologies | 72 | Siemens | 31 |

*Source: Burning Glass*

# Educational Supply

There are 10 community colleges in the Bay Region issuing 34 awards on average annually (last 3 years) on TOP 0702.00 - Computer Information Systems. There are four colleges in the East Bay Sub-Region issuing19 awards on average annually (last 3 years) on this TOP code.

**Table 7. Awards on TOP 0702.00 - Computer Information Systems in the Bay Region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Headcount | Associates | Certificates | Total |
| Alameda | East Bay |  n/a  | 4 | 3 | 7 |
| Berkeley City College  | East Bay |  146  |  |  |  |
| Chabot  | East Bay |  221  | 2 |  | 2 |
| Diablo Valley College  | East Bay |  741  |  |  |  |
| Evergreen Valley | Silicon Valley |  n/a  | 1 |  | 1 |
| Gavilan | Silicon Valley |  n/a  | 0 |  | 0 |
| Laney College  | East Bay |  294  |  |  |  |
| Las Positas | East Bay |  368  | 3 |  | 3 |
| Los Medanos | East Bay |  n/a  |  | 1 | 1 |
| Marin | North Bay |  181  | 0 | 1 | 1 |
| Merritt | East Bay |  390  | 3 | 3 | 6 |
| Mission | Silicon Valley |  211  | 6 |   | 6 |
| Monterey Peninsula College  | Santa Cruz - Monterey |  35  |  |   |   |
| Napa | North Bay |  161  | 3 | 0 | 3 |
| San Francisco  | Mid-Peninsula |  220  |  |   |   |
| Santa Rosa Junior College  | North Bay |  77  |  |   |   |
| Skyline | Mid-Peninsula |  n/a  | 3 | 1 | 4 |
| **Total Bay Region** |  **3,045**  |  **25**  |  **9**  |  **34**  |
| **Total East Bay Sub-Region** |  **2,160**  |  **12**  |  **7**  |  **19**  |

# *Source: IPEDS, Data Mart and Launchboard*

NOTE: Headcount of students who took one or more courses is for 2016-17. The annual average for awards is 2014-17 unless there are only awards in 2016-17. The annual average for other postsecondary is for 2013-16.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 14,441 annual openings for the Computer Information Systems occupational cluster and 34 annual (3-year average) awards for an annual undersupply of 14,407 students. In the East Bay Sub-Region, there is also a gap with 3,157 annual openings and 19 annual (3-year average) awards for an annual undersupply of 3,138 students.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0702.00 - Computer Information Systems**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay (All CTE Programs) | Diablo Valley College (All CTE Programs) | State (0702.00) | Bay (0702.00) | East Bay (0702.00) | Diablo Valley College (0702.00) |
| % Employed Four Quarters After Exit | 74% | 68% | 66% | 67% | 63% | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $9,308 | $7,865 | $9,919 | $7,941 | n/a |
| Median % Change in Earnings | 46% | 55% | 45% | 38% | 37% | n/a |
| % of Students Earning a Living Wage | 63% | 55% | 51% | 62% | 55% | n/a |

*Source: Launchboard Pipeline (version available on 3/8/19)*

# Skills, Certifications and Education

**Table 9. Top Skills for Computer Information Systems Occupations in Bay Region (March 2018 - Feb 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Administrative Support | 17,121 | SQL | 3,608 | Cisco | 2,598 |
| Customer Service | 11,765 | Spreadsheets | 3,582 | VMware | 2,595 |
| Project Management | 11,330 | Expense Reports | 3,281 | SAP | 2,444 |
| Scheduling | 10,788 | Printers | 3,174 | Microsoft Operating Systems | 2,385 |
| Technical Support | 9,095 | Python | 3,093 | Information Systems | 2,375 |
| Budgeting | 6,403 | Staff Management | 3,066 | Quality Assurance and Control | 2,347 |
| Linux | 5,212 | Administrative Functions | 3,000 | Business Process | 2,285 |
| System Administration | 4,504 | Oracle | 2,956 | Onboarding | 2,252 |
| Repair | 4,202 | Project Planning and Development Skills | 2,880 | Mailing | 2,248 |
| Data Entry | 4,097 | Appointment Setting | 2,836 | Domain Name System (DNS) | 2,159 |
| Customer Contact | 4,043 | Help Desk Support | 2,832 | General Office Duties | 2,146 |
| Microsoft Active Directory | 3,811 | Java | 2,828 | Record Keeping | 2,112 |
| Software Development | 3,766 | Hardware and Software Installation | 2,796 | Salesforce | 2,101 |
| Scrum | 3,621 | It Support | 2,752 | UNIX | 2,032 |
| Travel Arrangements | 3,618 | Atlassian JIRA | 2,632 | Software Installation | 2,025 |

*Source: Burning Glass*

**Table 10. Certifications for Computer Information Systems Occupations in the Bay Region (March 2018 - Feb 2019)**

Note: 82% 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 |
| Driver's License | 2,688 | Certified Scrum Professional (CSP) | 179 |
| Project Management Certification | 2,469 | Apple Certified Macintosh Technician | 161 |
| Project Management Professional (PMP) | 1,616 | Cisco Certified Internetwork Expert (CCIE) | 158 |
| IT Infrastructure Library (ITIL) Certification | 1,509 | PMI Agile Certified Practitioner (PMI-ACP) | 129 |
| Certified A+ Technician | 1,206 | Vmware Certified Professional (VCP) | 129 |
| Certified ScrumMaster (CSM) | 882 | Certified Information Systems Auditor  | 123 |
| Cisco Certified Network Associate (CCNA) | 603 | ITIL Foundation | 118 |
| ITIL Certification | 558 | Typing Certification | 115 |
| CompTIA Network+ | 451 | Series 7 | 104 |
| Microsoft Certified Professional (MCP) | 425 | Microsoft Certified Desktop Support Technician (Legacy) | 98 |
| Microsoft Certified Solutions Expert (MCSE) | 402 | Microsoft Certified Technology Specialist  | 97 |
| Security Clearance | 395 | Certified Information Security Manager  | 90 |
| Microsoft Certified Solutions Associate (MCSA) | 391 | Certified Scrum Trainer (CST) | 88 |
| Cisco Certified Network Professional (CCNP) | 265 | Red Hat Certified Engineer (RHCE) | 88 |
| Certified Information Systems Security Professional (CISSP) | 254 | Six Sigma Certification | 82 |
| CompTIA Security+ | 225 | SANS/GIAC Certification | 69 |
| First Aid Cpr Aed | 209 | Program Management Professional  | 68 |
| Agile Certification | 197 | Information Systems Certification | 63 |

*Source: Burning Glass*

**Table 11. Education Requirements for Computer Information Systems Occupations in Bay Region**

Note: 50% 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 |
| High school or vocational training | 7,797 (26%) |
| Associate Degree | 2,469 (8%) |
| Bachelor’s Degree or Higher | 19,621 (66%) |

*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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