** Computer Information Systems Occupations**

**Labor Market Information Report**

**San Jose City College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

June 2019

# 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 Silicon Valley sub-region (Santa Clara County.) There is a projected annual gap of about 12,740 students in the Bay region and 5,259 students in the Silicon Valley 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 San Jose City College and in the region.

# Introduction

This report profiles Computer Information Systems Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at San Jose City 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).

|  |
| --- |
| * **Computer Occupations, All Other (SOC 15-1199):** All computer occupationsnot 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 and Information Systems Managers** **(SOC 11-3021):** Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming. Excludes “Computer Occupations" (15-1111 through 15-1199).
 |
| Entry-Level Educational Requirement: Bachelor's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 21*%* |
|  |
| * **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*%* |
|  |
| * **Market Research Analysts and Marketing** **Specialists (SOC 13-1161):** Research market conditions in local, regional, or national areas, or gather information to determine potential sales of a product or service, or create a marketing campaign. May gather information on competitors, prices, sales, and methods of marketing and distribution.
 |
| Entry-Level Educational Requirement: Bachelor's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 14*%* |

# 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 |
| Computer Occupations, All Other | 19,731 | 21,972 | 2,242  | 11% | 9,101 | 1,820 | $26.99  | $53.32  |
| Computer and Information Systems Managers | 25,897 | 29,357 | 3,461  | 13% | 13,343 | 2,669 | $55.65  | $86.30  |
| Computer User Support Specialists | 29,393 | 34,005 | 4,612  | 16% | 15,944 | 3,189 | $20.02  | $32.70  |
| Market Research Analysts and Marketing Specialists | 38,559 | 44,533 | 5,974  | 15% | 25,484 | 5,097 | $20.63  | $40.24  |
| **Total** | **113,579** | **129,868** | **16,289**  | **14%** | **63,872** | **12,774** | **$29.56**  | **$51.06**  |

*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 Computer Information Systems Occupations in Silicon Valley 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 |
| Computer Occupations, All Other | 7,209 | 7,990 | 781  | 11% | 3,348 | 694 | $26.64  | $58.87  |
| Computer and Information Systems Managers | 12,049 | 13,360 | 1,311  | 11% | 5,978 | 1,237 | $57.84  | $90.14  |
| Computer User Support Specialists | 13,495 | 15,179 | 1,683  | 12% | 6,970 | 1,446 | $20.93  | $35.03  |
| Market Research Analysts and Marketing Specialists | 14,140 | 16,020 | 1,880  | 13% | 9,171 | 1,890 | $15.90  | $48.09  |
| **TOTAL** | **46,894** | **52,548** | **5,655**  | **12%** | **25,468** | **5,266** | **$29.77**  | **$56.79**  |

*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 (June 2018 - May 2019)**

| Occupation | Bay Region | Silicon Valley |
| --- | --- | --- |
|  Market Research Analysts and Marketing Specialists | 7,031 | 15,421 |
|  Information Technology Project Managers | 6,313 | 15,177 |
|  Computer User Support Specialists | 5,380 | 13,840 |
|  Computer and Information Systems Managers | 1,020 | 2,076 |
|  **Total** | **19,744** | **46,514** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Computer Information Systems Occupations for latest 12 months (June 2018 - May 2019) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Marketing Coordinator | 708 | Technology Manager | 214 |
| Marketing Associate | 700 | Desktop Support Technician | 187 |
| Marketing Specialist | 619 | Technical Sourcer | 176 |
| Technical Project Manager | 463 | Information Technology Technician | 168 |
| Marketing Analyst | 440 | Technical Support Specialist | 166 |
| Information Technology Manager | 420 | Director of Technology | 163 |
| Desktop Support | 420 | Director of Information Technology | 158 |
| Social Media Manager | 415 | Help Desk Technician | 148 |
| Information Technology Project Manager | 387 | Technical Lead | 144 |
| Project Manager | 340 | Sales Operations Analyst | 143 |
| Information Technology Support Specialist | 283 | Development Associate | 139 |
| Technical Support Engineer | 282 | Chief Technology Officer | 135 |
| Scrum Master | 226 | Information Technology Specialist | 131 |
| Marketing Assistant | 215 | Product Analyst | 130 |

**Table 4b. Top Job Titles for Computer Information Systems Occupations for latest 12 months (June 2018 - May 2019) Silicon Valley Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Silicon Valley | Common Title | Silicon Valley |
| Marketing Specialist | 1,732 | Information Technology Support Specialist | 483 |
| Marketing Coordinator | 1,494 | Technical Support Specialist | 441 |
| Marketing Associate | 1,313 | Help Desk Technician | 433 |
| Technical Project Manager | 1,101 | Information Technology Specialist | 426 |
| Information Technology Project Manager | 1,050 | Information Technology Technician | 414 |
| Desktop Support | 1,006 | Technical Lead | 404 |
| Information Technology Manager | 928 | Technology Manager | 397 |
| Project Manager | 830 | Sales Operations Analyst | 358 |
| Technical Support Engineer | 801 | Director of Information Technology | 345 |
| Marketing Analyst | 759 | Director of Technology | 305 |
| Social Media Manager | 671 | Infrastructure Project Manager | 280 |
| Marketing Assistant | 603 | Technical Sourcer | 274 |
| Desktop Support Technician | 533 | Social Media Specialist | 265 |
| Scrum Master | 493 | Operations Specialist | 251 |

*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 (2018) | Jobs in Industry (2022) | % Change (2018-22) | % in Industry (2018) |
| Custom Computer Programming Services (541511) | 16,360 | 18,512 | 13.2% | 14.0% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 10,851 | 14,435 | 33.0% | 9.3% |
| Computer Systems Design Services (541512) | 9,829 | 10,926 | 11.2% | 8.4% |
| Software Publishers (511210) | 7,784 | 9,274 | 19.1% | 6.7% |
| Electronic Computer Manufacturing (334111) | 5,960 | 6,351 | 6.6% | 5.1% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 5,461 | 5,907 | 8.2% | 4.7% |
| Data Processing, Hosting, and Related Services (518210) | 4,096 | 5,318 | 29.8% | 3.5% |
| Administrative Management and General Management Consulting Services (541611) | 2,584 | 3,137 | 21.4% | 2.2% |
| Other Computer Related Services (541519) | 2,316 | 2,742 | 18.4% | 2.0% |
| Other Scientific and Technical Consulting Services (541690) | 1,893 | 1,798 |  (5.0%) | 1.6% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 1,750 | 1,729 |  (1.2%) | 1.5% |
| Colleges, Universities, and Professional Schools (State Government) (902612) | 1,736 | 1,844 | 6.2% | 1.5% |
| Colleges, Universities, and Professional Schools (611310) | 1,628 | 1,760 | 8.1% | 1.4% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 1,359 | 1,278 |  (6.0%) | 1.2% |
| Local Government, Excluding Education and Hospitals (903999) | 1,264 | 1,328 | 5.1% | 1.1% |
| Marketing Consulting Services (541613) | 1,215 | 1,462 | 20.3% | 1.0% |
| Computer and Computer Peripheral Equipment and Software Merchant Wholesalers (423430) | 1,145 | 1,056 |  (7.8%) | 1.0% |

*Source: EMSI 2019.2*

**Table 6. Top Employers Posting Computer Information Systems Occupations in Bay Region and Silicon Valley Sub-Region (June 2018 - May 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Silicon Valley |
| Facebook | 298 | Gilead Sciences | 49 | Cisco Systems Incorporated | 415 |
| Salesforce | 166 | Best Buy | 49 | Facebook | 373 |
| Walmart / Sam's | 136 | Williams-Sonoma | 48 | Google Inc. | 288 |
| Gap Inc. | 126 | Levi Strauss | 48 | Cynet Systems Inc | 263 |
| Accenture | 112 | Juul Labs | 48 | Best Buy | 261 |
| Uber | 92 | Capital One | 46 | Wipro | 222 |
| Republic Bancorp | 87 | Wells Fargo | 45 | Apple Inc. | 200 |
| Deloitte | 83 | Milestone Technologies | 44 | IBM | 197 |
| Visa | 78 | Infosys | 43 | Infosys | 177 |
| Milestone Technologies Incorporated | 78 | Twitter | 42 | Walmart / Sam's | 173 |
| Oracle | 74 | Genentech | 42 | Salesforce | 173 |
| IBM | 65 | Wipro | 41 | Accenture | 172 |
| Cisco Systems Incorporated | 61 | Fountain Group | 40 | Milestone Technologies Incorporated | 152 |
| Google Inc. | 57 | SAP | 39 | Gap Inc. | 145 |
| Cynet Systems Inc | 56 | Twilio | 36 | Deloitte | 123 |
| Macy's | 55 | Splunk | 35 | Kaiser Permanente | 119 |
| Blue Cross Blue Shield of California | 52 | Sony Electronics Incorporated | 35 | SAP | 108 |

*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 two colleges in the Silicon Valley Sub-Region issuing 7 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 Hayward | East Bay |  221  | 2 |  | 2 |
| Diablo Valley College  | East Bay |  741  |  |  |  |
| Evergreen Valley | Silicon Valley |  n/a  | 1 |  | 1 |
| 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 Silicon Valley Sub-Region** | **211** |  **7**  | **0**  |  **7**  |

# *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 12,774 annual openings for the Computer Information Systems occupational cluster and 34 annual (3-year average) awards for an annual undersupply of 12,740 students. In the Silicon Valley Sub-Region, there is also a large gap with 5,266 annual openings and 7 annual (3-year average) awards for an annual undersupply of 5,259 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) | San Jose City College (All CTE Programs) | State (0702.00) | Bay (0702.00) | Silicon Valley (0702.00) | San Jose City College (0702.00) |
| % Employed Four Quarters After Exit | 74% | 77% | 66% | 67% | 86% | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $9,642 | $7,865 | $9,919 | $10,032 | n/a |
| Median % Change in Earnings | 46% | 44% | 45% | 38% | 47% | n/a |
| % of Students Earning a Living Wage | 63% | 61% | 51% | 62% | 52% | n/a |

*Source: Launchboard Pipeline (version available on 6/4/19)*

# Skills, Certifications and Education

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Project Management | 5,268 | Key Performance Indicators (KPIs) | 1,186 | Sales | 945 |
| Marketing | 3,827 | Product Management | 1,173 | Oracle | 943 |
| Technical Support | 3,118 | Digital Marketing | 1,170 | Scrum Master | 928 |
| Customer Service | 3,057 | Help Desk Support | 1,139 | Java | 905 |
| Budgeting | 2,753 | Software as a Service (SaaS) | 1,129 | Stakeholder Management | 870 |
| Social Media | 2,395 | Business Development | 1,113 | Onboarding | 862 |
| SQL | 1,962 | It Support | 1,098 | Linux | 843 |
| Salesforce | 1,771 | E-Commerce | 1,078 | Market Strategy | 798 |
| Scheduling | 1,755 | Microsoft Active Directory | 1,055 | Business-to-Business | 783 |
| Scrum | 1,609 | Quality Assurance and Control | 1,048 | Product Marketing | 779 |
| Software Development | 1,523 | Printers | 1,031 | Information Systems | 770 |
| Facebook | 1,385 | Python | 1,009 | Hardware and Software Installation | 749 |
| Atlassian JIRA | 1,236 | Repair | 989 | Microsoft Operating Systems | 739 |
| Project Planning and Development Skills | 1,235 | Business Process | 972 | Product Development | 735 |
| Customer Contact | 1,208 | Adobe Photoshop | 965 | Instagram | 729 |

*Source: Burning Glass*

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

Note: 84% 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 | 986 | Certified Information Systems Security Professional (CISSP) | 107 |
| Project Management Professional (PMP) | 659 | Apple Certified Macintosh Technician | 107 |
| IT Infrastructure Library (ITIL) Certification | 476 | Microsoft Certified Solutions Associate (MCSA) | 85 |
| Certified ScrumMaster (CSM) | 441 | Certified Public Accountant (CPA) | 85 |
| Certified A+ Technician | 425 | Microsoft Certified Solutions Expert (MCSE) | 83 |
| Driver's License | 407 | Certified Information Systems Auditor (CISA) | 83 |
| Microsoft Certified Professional (MCP) | 165 | PMI Agile Certified Practitioner (PMI-ACP) | 63 |
| ITIL Certification | 164 | Certified Information Security Manager (CISM) | 62 |
| CompTIA Network+ | 152 | CompTIA Security+ | 51 |
| Agile Certification | 120 | ITIL Foundation | 42 |
| Cisco Certified Network Associate (CCNA) | 119 | Security Clearance | 38 |
| Certified Scrum Professional (CSP) | 114 | Cisco Certified Network Professional (CCNP) | 37 |

*Source: Burning Glass*

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

Note: 47% 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 | 444 | 4% |
| Associate Degree | 490 | 5% |
| Bachelor’s Degree or Higher | 9,067 | 91% |

*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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