**JavaScript Specialist Occupations**

**Labor Market Information Report**

**City College of San Francisco**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

October 2020

# Recommendation

Based on all available data, there appears to be an undersupply of JavaScript Specialist workers compared to the demand for this cluster of occupations in the Bay region and in the Mid-Peninsula sub-region (San Francisco and San Mateo Counties). There is a projected annual gap of about 22,825 students in the Bay region and 8,712 students in the Mid-Peninsula Sub-Region.

This report also provides student outcomes data on employment and earnings for TOP 0708.10-Computer Networking 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 City College of San Francisco and in the region.

**Introduction**

This report profiles JavaScript Specialist Occupations in the 12 county Bay region and in the Mid-Peninsula sub-region for the review of an existing low unit, local certificate program at City College of San Francisco (CCSF). 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).

|  |
| --- |
| * **Web Developers / Web Developers and Digital Interface Designers (15-1134 / 15-1257):** Design, create, and modify Web sites. Analyze user needs to implement Web site content, graphics, performance, and capacity. May integrate Web sites with other computer applications. May convert written, graphic, audio, and video components to compatible Web formats by using software designed to facilitate the creation of Web and multimedia content. Excludes “Multimedia Artists and Animators” (27-1014). |
| Entry-Level Educational Requirement: Associate's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 25% |
| * **Software Developers, Applications / Software Developers and Software Quality Assurance Analysts and Testers (15-1132 / 15-1256):** Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. May supervise computer programmers. |
| Entry-Level Educational Requirement: Bachelor's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 13*%* |
| * **Computer Programmers (15-1131 / 15-1251):** Create, modify, and test the code, forms, and script that allow computer applications to run. Work from specifications drawn up by software developers or other individuals. May assist software developers by analyzing user needs and designing software solutions. May develop and write computer programs to store, locate, and retrieve specific documents, data, and information. |
| 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 (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% |

**Occupational Demand Table 1. Employment Outlook for JavaScript Specialist 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 |
| Web Developers / Web Developers and Digital Interface Designers | 11,305 | 13,309 | 2,004 | 18% | 6,679 | 1,336 | $29.02 | $45.01 |
| Software Developers, Applications / Software Developers and Software Quality Assurance Analysts and Testers | 148,314 | 173,592 | 25,278 | 17% | 87,746 | 17,549 | $52.78 | $67.71 |
| Computer Programmers | 10,862 | 11,710 | 848 | 8% | 4,951 | 990 | $40.41 | $53.42 |
| Computer Occupations, All Other | 38,974 | 42,324 | 3,350 | 9% | 19,456 | 3,891 | $41.02 | $56.51 |
| **TOTAL** | **209,455** | **240,935** | **31,480** | **15%** | **118,832** | **23,766** | **$48.67** | **$63.66** |

*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 JavaScript Specialist Occupations in Mid-Peninsula 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 |
| Web Developers / Web Developers and Digital Interface Designers | 4,980 | 6,052 | 1,073 | 22% | 3,167 | 633 | $33.76 | $52.38 |
| Software Developers, Applications / Software Developers and Software Quality Assurance Analysts and Testers | 44,418 | 56,011 | 11,593 | 26% | 31,035 | 6,207 | $57.03 | $72.08 |
| Computer Programmers | 4,396 | 4,943 | 547 | 12% | 2,207 | 441 | $44.34 | $57.52 |
| Computer Occupations, All Other | 14,636 | 16,648 | 2,012 | 14% | 8,174 | 1,635 | $42.37 | $56.67 |
| **TOTAL** | **68,429** | **83,654** | **15,225** | **22%** | **44,584** | **8,917** | **$51.39** | **$66.42** |

*Source: EMSI 2020.3*

**Mid-Peninsula Sub-Region includes:** San Francisco and San Mateo Counties

### Job Postings in Bay Region and Mid-Peninsula Sub-Region

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

| Occupation | Bay Region | Mid-Peninsula Sub-Region |
| --- | --- | --- |
| Software Developers, Applications | 115,084 | 40,783 |
| Web Developers | 25,314 | 10,012 |
| Information Technology Project Managers | 15,549 | 6,395 |
| Computer Programmers | 5,105 | 1,656 |
| Software Developers, Systems Software | 1,276 | 363 |
| **TOTAL** | **162,328** | **59,209** |

*Source: Burning Glass*

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

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Software Development Engineer | 33,961 | Engineer | 1,474 |
| Java Developer | 10,072 | Applications Developer | 1,373 |
| Devops Engineer | 4,818 | Senior Engineer | 1,357 |
| Software Developer | 3,033 | Technical Project Manager | 1,274 |
| Applications Engineer | 3,023 | .Net Developer | 1,265 |
| Java Engineer | 2,226 | Principal Software Engineer | 1,245 |
| User Experience (UX) Designer | 2,094 | iOS Developer | 1,123 |
| Senior Developer | 2,087 | Project Manager | 1,083 |
| User Interface (UI) Developer | 2,042 | Information Technology Project Manager | 1,071 |
| Developer | 2,023 | Senior Devops Engineer | 992 |
| Python Developer | 1,898 | User Interface (UX)/User Experience (UX) Designer | 963 |
| Front End Developer | 1,823 | Salesforce Developer | 950 |
| Android Developer | 1,682 | Information Technology Manager | 877 |
| Web Developer | 1,484 | Software Engineering Manager | 862 |

**Table 4b. Top Job Titles for JavaScript Specialist Occupations for latest 12 months (Sept 2019 - Aug 2020) Mid-Peninsula Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Mid-Peninsula | Common Title | Mid-Peninsula |
| Software Development Engineer | 13,325 | Applications Developer | 509 |
| Java Developer | 2,436 | Technical Project Manager | 502 |
| Devops Engineer | 1,566 | Engineer | 502 |
| User Experience (UX) Designer | 1,009 | Web Developer | 495 |
| Software Developer | 847 | Python Developer | 470 |
| Senior Developer | 828 | Software Engineering Manager | 468 |
| Senior Engineer | 745 | Information Technology Project Manager | 458 |
| Java Engineer | 727 | Senior Devops Engineer | 456 |
| Developer | 724 | iOS Developer | 444 |
| Applications Engineer | 722 | Salesforce Developer | 425 |
| Android Developer | 619 | .Net Developer | 423 |
| Front End Developer | 610 | Project Manager | 413 |
| User Interface (UI) Developer | 552 | Information Technology Manager | 402 |
| Principal Software Engineer | 529 | User Interface (UX)/User Experience (UX) Designer | 374 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring JavaScript Specialist 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) | 44,105 | 52,755 | 20% | 21% |
| Computer Systems Design Services (541512) | 25,925 | 29,778 | 15% | 12% |
| Software Publishers (511210) | 25,085 | 31,590 | 26% | 12% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 19,340 | 24,647 | 27% | 9% |
| Electronic Computer Manufacturing (334111) | 15,897 | 17,184 | 8% | 8% |
| Data Processing, Hosting, and Related Services (518210) | 8,487 | 11,218 | 32% | 4% |
| Other Computer Related Services (541519) | 5,945 | 7,367 | 24% | 3% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 5,004 | 5,233 | 5% | 2% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 3,504 | 3,697 | 6% | 2% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 2,462 | 2,382 | -3% | 1% |
| Engineering Services (541330) | 2,178 | 2,329 | 7% | 1% |
| Semiconductor and Related Device Manufacturing (334413) | 2,139 | 1,885 | -12% | 1% |
| Research and Development in Biotechnology (except Nanobiotechnology) (541714) | 2,042 | 2,588 | 27% | 1% |

*Source: EMSI 2020.3*

**Table 6. Top Employers Posting JavaScript Specialist Occupations in Bay Region and Mid-Peninsula Sub-Region (Sept 2019 - Aug 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Mid-Peninsula |
| Apple Inc. | 2,061 | Microsoft Corporation | 395 | Amazon | 929 |
| Amazon | 1,984 | NTT Data | 385 | Facebook | 597 |
| Cisco Systems Incorporated | 921 | Wipro | 383 | Salesforce | 430 |
| Vmware Incorporated | 825 | Nsys Design Systems | 381 | Wells Fargo | 327 |
| Facebook | 734 | Workday, Inc | 376 | Oracle | 308 |
| Nvidia Corporation | 627 | Intelliswift Software | 353 | Accenture | 275 |
| Oracle | 602 | Intuit | 342 | Cisco Systems Incorporated | 230 |
| IBM | 586 | Bayone Solutions | 308 | Deloitte | 225 |
| Google Inc. | 554 | SAP | 294 | Visa | 199 |
| Infobahn Softworld Incorporated | 553 | Osi Engineering | 289 | Infobahn Softworld Incorporated | 187 |
| Wells Fargo | 498 | Walmart / Sam's | 277 | Autodesk Incorporated | 179 |
| Xoriant Incorporated | 477 | eBay | 276 | Twitter | 167 |
| Accenture | 471 | Infosys | 275 | Splunk | 167 |
| Salesforce | 464 | Ascent Technology Services | 271 | Microsoft Corporation | 158 |
| Paypal | 464 | Idc Technologies | 269 | Jefferson Frank | 147 |
| Splunk | 429 | Samsung America, Inc. | 267 | Square Incorporated | 133 |
| Deloitte | 409 | Tranzeal, Inc | 256 | Google Inc. | 132 |

*Source: Burning Glass*

**Educational Supply**

There are 28 community colleges in the Bay Region issuing 801 awards on average annually (last 3 years ending 2018-19) on TOP 0708.10-Computer Networking. There are four colleges in the Mid-Peninsula Sub-Region issuing 178 awards on average annually (last 3 years) on this TOP code.

There are five (5) Other Educational Institutions in the Bay Region issuing 53 awards on average annually (last 3 years ending 2016-17) on TOP 0708.10-Computer Networking. There are two (2) Other Educational Institutions in the Mid-Peninsula Sub-Region issuing five (5) awards on average annually (last 3 years) on this TOP code.

There are four (4) Institutions in the Bay Region issuing 87 Bachelor’s degrees on average annually (last 3 years ending 2016-17) on TOP 0708.10-Computer Networking. There is one Institution in the Mid-Peninsula Sub-Region issuing 22 Bachelor’s degrees on average annually (last 3 years) on this TOP code.

**Table 7a. Community College Awards on TOP 0708.10-Computer Networking in Bay Region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Certificate Low Unit | Noncredit | Total |
| Alameda | East Bay |  | 3 |  | 3 |
| Berkeley City | East Bay | 5 | 7 |  | 12 |
| Cabrillo | SC - Monterey | 19 | 32 |  | 51 |
| Canada | Mid-Peninsula | 7 | 13 |  | 20 |
| Chabot | East Bay | 16 | 29 |  | 45 |
| Contra Costa | East Bay |  | 6 |  | 6 |
| De Anza | Silicon Valley | 29 | 49 |  | 78 |
| Diablo Valley | East Bay | 14 | 36 |  | 50 |
| Evergreen Valley | Silicon Valley | 24 | 5 |  | 29 |
| Foothill | Silicon Valley | 26 | 15 | 48 | 89 |
| Gavilan | Silicon Valley | 6 | 3 |  | 9 |
| Hartnell | SC - Monterey |  | 6 |  | 6 |
| Laney | East Bay | 16 | 6 |  | 22 |
| Las Positas | East Bay |  | 8 | 1 | 9 |
| Los Medanos | East Bay | 16 | 9 |  | 25 |
| Marin | North Bay |  | 4 |  | 4 |
| Merritt | East Bay | 10 | 3 |  | 13 |
| Mission | Silicon Valley | 16 | 9 |  | 25 |
| Monterey | SC - Monterey | 6 | 5 |  | 11 |
| Napa | North Bay | 5 | 6 |  | 11 |
| Ohlone | East Bay | 5 | 40 |  | 45 |
| San Francisco | Mid-Peninsula | 7 | 15 |  | 22 |
| San Francisco Ctrs | Mid-Peninsula |  |  | 17 | 17 |
| San Jose City | Silicon Valley | 11 | 13 |  | 24 |
| San Mateo | Mid-Peninsula | 28 | 63 |  | 91 |
| Santa Rosa | North Bay |  | 35 |  | 35 |
| Skyline | Mid-Peninsula | 12 | 16 |  | 28 |
| Solano | North Bay | 11 | 9 |  | 20 |
| West Valley | Silicon Valley |  | 1 |  | 1 |
| **Total Bay Region** | | **289** | **446** | **66** | **801** |
| **Total Mid-Peninsula Sub-Region** | | **54** | **107** | **17** | **178** |

Source: Data Mart

Note: The annual average for awards is 2016-17 to 2018-19.

**Table 7b. Other Educational Institutions Awards on TOP 0708.10-Computer Networking in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| College | Sub-Region | | Associate Degree | | Award < 1 academic yr. | | Total | |
| Academy of Art University | Mid-Peninsula | | 4 | |  | | 4 | |
| Golden Gate University-San Francisco | Mid-Peninsula | |  | | 1 | | 1 | |
| ITT Technical Institute-Concord | East Bay | | 6 | |  | | 6 | |
| ITT Technical Institute-Oakland | East Bay | | 4 | |  | | 4 | |
| Unitek College | East Bay | |  | | 38 | | 38 | |
| **Total Bay Region** | | **14** | | **39** | | **53** | |
| **Total Mid-Peninsula Sub-Region** | | **4** | | **1** | | **5** | |

Source: Data Mart

Note: The annual average for awards is 2014-15 to 2016-17.

**Table 7c. Bachelor’s Degree Awards on TOP 0708.10-Computer Networking in Bay Region**

|  |  |  |
| --- | --- | --- |
| College | Sub-Region | Bachelor’s Degree |
| Academy of Art University | Mid-Peninsula | 22 |
| Cogswell College | Silicon Valley | 3 |
| ITT Technical Institute-Concord | East Bay | 7 |
| University of California-Santa Cruz | SC - Monterey | 55 |
| **Total Bay Region** | | **87** |
| **Total Mid-Peninsula Sub-Region** | | **22** |

Source: Data Mart

# Note: The annual average for awards is 2014-15 to 2016-17.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 23,766 annual openings for the JavaScript Specialist occupational cluster and 941 annual (3-year average) awards for an annual undersupply of 22,825 students. In the Mid-Peninsula Sub-Region, there is also a gap with 8,917 annual openings and 205 annual (3-year average) awards for an annual undersupply of 8,712 students.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0708.10-Computer Networking**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2017-18** | **Bay**  All CTE Programs | **CCSF**  All CTE Programs | **State** 0708.10 | **Bay** 0708.10 | **Mid-Peninsula** 0708.10 | **CCSF** 0708.10 |
| % Employed Four Quarters After Exit | 74% | 66% | 69% | 66% | 64% | 63% |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $12,765 | $11,960 | $13,468 | $14,845 | $14,845 |
| Median % Change in Earnings | 46% | 25% | 22% | 25% | 31% | 32% |
| % of Students Earning a Living Wage | 63% | 46% | 66% | 58% | 54% | 54% |

*Source: Launchboard Pipeline (version available on (9/15/20)*

# Skills, Certifications and Education

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skill** | **Postings** | **Skill** | **Postings** | **Skill** | **Postings** |
| Java | 58,568 | Scrum | 14,312 | Version Control | 10,654 |
| Software Engineering | 53,371 | NoSQL | 13,983 | Scalability Design | 10,573 |
| JavaScript | 39,763 | React Javascript | 13,627 | Agile Development | 10,560 |
| Software Development | 37,883 | Oracle | 13,556 | MySQL | 10,543 |
| Python | 37,585 | Docker Software | 13,356 | Microsoft C# | 10,062 |
| SQL | 35,781 | Unit Testing | 13,233 | Quality Assurance and Control | 10,002 |
| Git | 22,575 | Object-Oriented Analysis and Design (OOAD) | 13,200 | Continuous Integration (CI) | 9,841 |
| Linux | 21,223 | Ruby | 12,829 | Apache Kafka | 9,260 |
| C++ | 18,629 | Web Development | 12,752 | UNIX | 9,210 |
| Project Management | 16,581 | Web Application Development | 12,559 | HTML5 | 9,075 |
| DevOps | 15,198 | Kubernetes | 12,261 | Swift (Programming Language) | 9,052 |
| Debugging | 14,683 | Node.js | 11,707 | Ruby on Rails | 8,741 |
| AngularJS | 13,962 | Oracle | 13,556 | Salesforce | 8,204 |

*Source: Burning Glass*

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

Note: 94% 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 | 2,898 | Agile Certification | 205 |
| Project Management Professional (PMP) | 2,057 | SANS/GIAC Certification | 188 |
| Certified ScrumMaster (CSM) | 1,036 | PMI Agile Certified Practitioner (PMI-ACP) | 187 |
| IT Infrastructure Library (ITIL) Certification | 960 | MBE Certified | 176 |
| Security Clearance | 876 | Certified Information Security Manager (CISM) | 160 |
| Certified Salesforce Platform Developer | 664 | Certified Scrum Trainer (CST) | 159 |
| Driver's License | 589 | Cisco Certified Network Professional (CCNP) | 155 |
| Certified Information Systems Security Professional (CISSP) | 397 | Certified Salesforce Platform Developer II | 136 |
| Certified Scrum Professional (CSP) | 232 | CompTIA Security+ | 126 |
| Certified Information Systems Auditor (CISA) | 232 | Cisco Certified Internetwork Expert (CCIE) | 113 |
| Certified Salesforce Administrator | 221 | Microsoft Certified Solutions Expert (MCSE) | 104 |
| Cisco Certified Network Associate (CCNA) | 215 | Microsoft Certified Professional (MCP) | 99 |

*Source: Burning Glass*

**Table 11. Education Requirements for JavaScript Specialist Occupations in Bay Region**

|  |  |  |
| --- | --- | --- |
| **Education (minimum advertised)** | **Latest 12 Mos. Postings** | **Percent 12 Mos. Postings** |
| High school or vocational training | 1,669 | 2% |
| Associate Degree | 549 | 1% |
| Bachelor’s Degree or Higher | 74,108 | 97% |

*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