** Computer Occupations for Web Development**

**Labor Market Information Report**

**Las Positas 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 workers for Web Development 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 16,206 students in the Bay region and 1,835 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 Las Positas College and in the region.

# Introduction

This report profiles Computer Occupations for Web Development in the 12 county Bay region and in the East Bay sub-region for a proposed new program at Las Positas College.

|  |
| --- |
| * **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 Systems Analysts (SOC 15-1121):** 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*%* |
|  |
| * **Software Developers, Applications (SOC 15-1132):** 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*%* |

# Occupational Demand

**Table 1. Employment Outlook for Computer Occupations for Web Development** **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 |
| Computer and Information Systems Managers |  32,494  |  36,105  | 3,611 | 11% |  15,818  |  3,164  | $70.26 | $88.21 |
| Computer Systems Analysts |  29,219  |  32,865  | 3,646 | 12% |  13,306  |  2,661  | $43.74 | $55.71 |
| Software Developers, Applications |  93,746  |  113,800  | 20,054 | 21% |  52,135  |  10,427  | $49.53 | $63.41 |
| **Total** |  **155,460**  |  **182,770**  | **27,311** | **18%** |  **81,259**  |  **16,252**  | **$52.77** | **$67.15** |

*Source: EMSI 2019.3*

**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 Computer Occupations for Web Development** **in East Bay 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 |
| Computer and Information Systems Managers |  5,845  |  5,997  | 151 | 3% |  2,278  |  456  | $62.81 | $78.48 |
| Computer Systems Analysts |  5,086  |  5,237  | 151 | 3% |  1,774  |  355  | $39.69 | $49.81 |
| Software Developers, Applications |  12,199  |  13,438  | 1,239 | 10% |  5,248  |  1,050  | $47.22 | $59.45 |
| **TOTAL** |  **23,130**  |  **24,672**  | **1,541** | **7%** |  **9,300**  |  **1,860**  | **$49.50** | **$62.14** |

*Source: EMSI 2019.3* **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 (December 2018 - November 2019)**

| Occupation | Bay Region | East Bay |
| --- | --- | --- |
|  Software Developers, Applications | 132,714 | 17,165 |
|  Computer Systems Analysts | 18,329 | 3,209 |
|  Computer and Information Systems Managers | 2,332 | 334 |
|  Informatics Nurse Specialists | 13 | 2 |
|  **Total** | **153,388** | **20,710** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Computer Occupations for Web Development** **for latest 12 months (December 2018 - November 2019) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Software Development Engineer | 37,208 | Senior Devops Engineer | 1,328 |
| Java Developer | 10,241 | Engineer | 1,247 |
| Devops Engineer | 4,900 | .Net Developer | 1,213 |
| Software Developer | 3,702 | Software Engineering Manager | 1,056 |
| Applications Engineer | 3,624 | Salesforce Developer | 1,049 |
| Developer | 3,257 | Systems Analyst | 1,048 |
| Business Systems Analyst | 3,233 | Senior Engineer | 965 |
| Java Engineer | 2,844 | Full Stack Developer | 819 |
| Python Developer | 2,461 | Software Architect | 811 |
| Senior Developer | 2,109 | Technical Consultant | 795 |
| Android Developer | 2,061 | Full Stack Engineer | 700 |
| Applications Developer | 1,698 | C++ Developer | 679 |
| Principal Software Engineer | 1,456 | Business Analyst | 653 |
| iOS Developer | 1,332 | Business Intelligence Developer | 627 |

**Table 4b. Top Job Titles for Computer Occupations for Web Development** **for latest 12 months (December 2018 - November 2019) East Bay Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | East Bay | Common Title | East Bay |
| Software Development Engineer | 3,863 | Python Developer | 193 |
| Java Developer | 1,546 | Salesforce Developer | 141 |
| Devops Engineer | 851 | Business Intelligence Developer | 138 |
| Business Systems Analyst | 651 | Principal Software Engineer | 133 |
| Software Developer | 596 | Senior .Net Developer | 129 |
| Developer | 528 | Lead Developer | 123 |
| Applications Engineer | 499 | Technical Consultant | 120 |
| .Net Developer | 456 | Engineer | 119 |
| Senior Developer | 311 | Junior Software Engineer | 110 |
| Java Engineer | 283 | iOS Developer | 109 |
| Applications Developer | 279 | Software Architect | 109 |
| Systems Analyst | 221 | Sharepoint Developer | 106 |
| Android Developer | 212 | Java/J2EE Developer | 105 |
| Senior Devops Engineer | 200 | Full Stack Developer | 105 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Computer Workers for Web Development 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) | 33,401 | 40,255 | 21% | 22% |
| Computer Systems Design Services (541512) | 20,833 | 24,182 | 16% | 13% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 17,707 | 23,382 | 32% | 11% |
| Software Publishers (511210) | 15,688 | 20,099 | 28% | 10% |
| Electronic Computer Manufacturing (334111) | 9,154 | 10,211 | 12% | 6% |
| Data Processing, Hosting, and Related Services (518210) | 6,573 | 8,688 | 32% | 4% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 5,924 | 6,392 | 8% | 4% |
| Other Computer Related Services (541519) | 4,466 | 5,570 | 25% | 3% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 2,079 | 2,283 | 10% | 1% |
| Local Government, Excluding Education and Hospitals (903999) | 1,582 | 1,663 | 5% | 1% |

*Source: EMSI 2019.3*

**Table 6. Top Employers Posting Computer Occupations for Web Development** **in Bay Region and East Bay Sub-Region (December 2018 - November 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | East Bay |
| Apple Inc. | 2,119 | Microsoft Corp | 370 | Workday, Inc | 477 |
| Amazon | 1,372 | Wipro | 326 | Scoop Technologies | 273 |
| Cisco Systems Inc | 1,186 | Intuit | 322 | Kaiser Permanente | 173 |
| Google Inc. | 891 | Splunk | 321 | NTT Data | 98 |
| Scoop Technologies | 874 | Xoriant Inc | 303 | Oracle | 88 |
| Facebook | 685 | Deloitte | 297 | General Electric Co | 86 |
| Workday, Inc | 659 | Verizon Communications Inc | 296 | Ellie Mae | 85 |
| Vmware Inc | 656 | Uber | 289 | Perficient Incorporated | 82 |
| Oracle | 650 | Adobe Systems | 288 | The Nielsen Company | 81 |
| IBM | 550 | Intel Corporation | 277 | Tesla | 74 |
| SAP | 443 | Intelliswift Software | 265 | Albertsons | 72 |
| Accenture | 442 | Splunk, Inc | 264 | Tesla Motors | 71 |
| Nvidia Corporation | 406 | Linkedin Limited | 240 | Lucid Motors Inc | 71 |
| Salesforce | 396 | eBay | 233 | UC Berkeley | 64 |
| Walmart / Sam's | 393 | Neuvo Usa | 230 | Bank of the West | 58 |
| Paypal | 389 | NTT Data | 227 | Ramy Infotech | 53 |
| Visa | 387 | Idc Technologies | 225 | Oakland Unified School District | 53 |

*Source: Burning Glass*

# Educational Supply

There are 12 community colleges in the Bay Region issuing 46 awards on average annually (last 3 years) on TOP 0702.00 - Computer Information Systems. There are six colleges in the East Bay Sub-Region issuing 25 awards on average annually (last 3 years) on this TOP code.

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Certificate 18+ units | Total |
| Berkeley City College  | East Bay |  1  |  |  1  |
| Chabot College  | East Bay |  2  |  |  2  |
| College of Alameda  | East Bay |  6  |  3  |  9  |
| College of Marin  | North Bay |   |  1  |  1  |
| Evergreen Valley College  | Silicon Valley |  1  |  |  1  |
| Gavilan College  | Santa Cruz - Monterey |  1  |  |  1  |
| Las Positas College  | East Bay |  3  |  |  3  |
| Los Medanos College  | East Bay |  |  1  |  1  |
| Merritt College  | East Bay |  4  |  5  |  9  |
| Mission College  | Silicon Valley |  10  |  1  |  11  |
| Napa Valley College  | North Bay |  3  |  0  |  3  |
| Skyline College  | Mid-Peninsula |  3  |  1  |  4  |
| **Total Bay Region** |  **34**  |  **12**  |  **46**  |
| **Total East Bay Sub-Region** |  **16**  |  **9**  |  **25**  |

# *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 16,252 annual openings for the Computer Occupations for Web Development occupational cluster and 46 annual (3-year average) awards for an annual undersupply of 16,206 students. In the East Bay Sub-Region, there is also a large gap with 1,860 annual openings and 25 annual (3-year average) awards for an annual undersupply of 1,835 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) | Las Positas College (All CTE Programs) | State (0702.00) | Bay (0702.00) | East Bay (0702.00) | Las Positas College (0702.00) |
| % Employed Four Quarters After Exit | 74% | 75% | 66% | 67% | 63% | 67% |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $10,000 | $7,865 | $9,919 | $7,941 | $8,823 |
| Median % Change in Earnings | 46% | 28% | 45% | 35% | 37% | 74% |
| % of Students Earning a Living Wage | 63% | 64% | 51% | 66% | 55% | 57% |

*Source: Launchboard Pipeline (version available on 11/22/19)*

# Skills, Certifications and Education

**Table 9. Top Skills for Computer Occupations for Web Development** **in Bay Region (December 2018 - November 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Java | 58,148 | Kubernetes | 11,565 | Scalability Design | 8,933 |
| Software Engineering | 53,595 | Data Structures | 11,106 | AngularJS | 8,881 |
| Software Development | 40,532 | Continuous Integration (CI) | 11,031 | Extensible Markup Language (XML) | 8,662 |
| Python | 38,907 | NoSQL | 10,965 | Machine Learning | 8,514 |
| SQL | 32,606 | UNIX | 10,766 | Big Data | 8,369 |
| JavaScript | 30,441 | Web Application Development | 10,697 | React Javascript | 8,338 |
| Linux | 22,984 | Project Management | 10,631 | Relational Databases | 8,227 |
| C++ | 22,250 | Agile Development | 10,589 | JavaScript Object Notation (JSON) | 8,153 |
| Git | 17,264 | Quality Assurance and Control | 10,101 | Apache Hadoop | 7,978 |
| DevOps | 16,590 | Docker Software | 9,729 | Business Process | 7,915 |
| Oracle | 15,878 | MySQL | 9,720 | HTML5 | 7,403 |
| Debugging | 15,617 | Microsoft C# | 9,680 | Node.js | 7,310 |
| Object-Oriented Analysis and Design (OOAD) | 14,816 | Software Architecture | 9,550 | Product Management | 7,245 |
| Unit Testing | 13,047 | Apache Kafka | 9,161 | Software as a Service (SaaS) | 7,109 |
| Scrum | 11,728 | Salesforce | 9,052 | Product Development | 7,088 |

*Source: Burning Glass*

**Table 10. Certifications for Computer Occupations for Web Development** **in Bay Region (December 2018 - November 2019)**

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 |
| Security Clearance | 2,023 | SANS/GIAC Certification | 216 |
| IT Infrastructure Library (ITIL) Certification | 1,033 | Cisco Certified Network Professional (CCNP) | 215 |
| Project Management Certification | 606 | Certified Salesforce Platform Developer II | 207 |
| Driver's License | 579 | CompTIA Security+ | 203 |
| Certified Information Systems Security Professional (CISSP) | 405 | Certified Information Systems Auditor (CISA) | 191 |
| Certified Salesforce Platform Developer | 390 | SAP Certification | 137 |
| ITIL Certification | 365 | Certified ScrumMaster (CSM) | 133 |
| Salesforce Developer | 315 | Certified Salesforce Platform Developer I | 131 |
| Cisco Certified Network Associate (CCNA) | 287 | Mbe Certified | 123 |
| Certified Salesforce Administrator | 269 | Certified Salesforce Advanced Administrator | 123 |
| Cisco Certified Internetwork Expert (CCIE) | 232 | Salesforce Platform App Builder | 115 |
| Project Management Professional (PMP) | 224 | Microsoft Certified Solutions Associate (MCSA) | 101 |

*Source: Burning Glass*

**Table 11. Education Requirements for Computer Occupations for Web Development** **in Bay Region**

Note: 46% 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 | 969 | 1% |
| Associate Degree | 619 | 1% |
| Bachelor’s Degree or Higher | 73,941 | 98% |

*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 or (831) 479-6481
* John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, jcarrese@ccsf.edu or (415) 267-6544